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NEWS, NEWS AND INTERVIEWS.

The fame achieved by Gen. Horace Porter for his unparalleled management of the monster sound-money parade in New York city on October 31 has become almost universal. The immensity of the undertaking he was called upon to manage was appreciated by those spectators who held their places for eight hours, while 125,000 business men filed past. When General Porter reached his headquarters near the end of the line of march he began to receive reports as to the progress of the parade. The majority of these reports were received over the telephone. General Porter's aides, in transmitting reports from along the line, used the regular public telephone stations of the New York Telephone Company. No extra telephones were installed for the purpose, the regular service of the company proving amply sufficient. It is a great compliment to the completeness of the telephone system in New York city that this feat was accomplished without involving any extra work. The New York Telephone Company made no charge for the excellent service it rendered, donating the cost to the cause of sound money.

Contracts for the electric lighting of New York city will be let on December 2. Electric lights will be installed on Thirty-third street from Broadway to Fifth avenue.

The passengers on a Chestnut street car enjoyed a good laugh the other afternoon that was worth double the fare, says a Philadelphia paper. At Eighteenth and Chestnut streets the car stopped, and an old man, who attracted considerable attention, got on. He looked like a man who had built up a brisk business in some provincial town. He sat down near the rear platform, and when the conductor came in for his fare he handed him a quarter and pocketed his change.

"Say," he shouted, "you give me a receipt!"

"A what?"

"I want a receipt. First thing I know some other conductor'll get on here and'll want another fare. You give me a receipt."

The other passengers laughed, but the old man persisted: "You give me a receipt."

"My good man," said the conductor, "we do not give receipts. Your fare is paid, and it is all right."

The old man was not satisfied with this, and still requested his receipt. The conductor went out on the platform and pondered deeply for a moment. Then he fished an old transfer ticket from his pocket and handed it to the passenger. He was satisfied with this, and held it tightly in his fingers until the car reached Eleventh street, when he got off.

During the campaign just closed there were many humorous occurrences chronicled in the New York *Sun*. One of the most recent concerned Col. Harry Swords, sergeant-at-arms of Republican headquarters in New York city. It is as follows: He had a mustache, the ends of which were waxed to sharp points. He also had a goatee and a swarthy face. He stuck his nose into Colonel Swords's room and said: "I would see ze Cornell Swats."

"What?" demanded Colonel Swords.

"Cornell Swats; Monsieur Swats; ze monsieur, ees he here?"

"Swats? Swats? There's nobody named Swats here," said the Colonel.

"Oui, Monsieur Swats; ze Cornell; ze militaire; ze Cornell, you know— Monsieur Swats; ze Cornell Swats."

"Oh, what in blazes are you talking about?" demanded Colonel Swords.

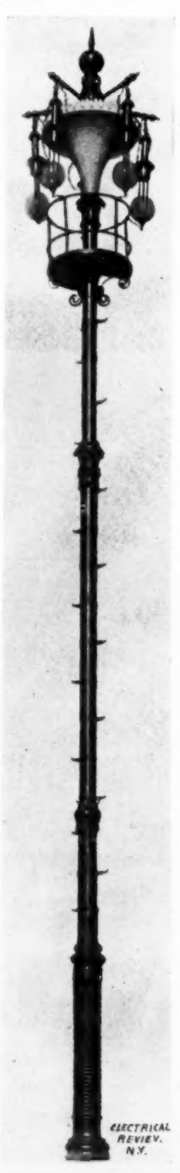
"You shall not laugh," thundered the man; "you shall not. It ees ze Cornell I want to see; ze Cornell; ze militaire, you know. I haf been delegated ze telephone to fix and ze Cornell to see."

"Well, I don't know what in blazes you want," said the Colonel. "There's no Swats around here. If you go across the street to that Popocratic headquarters tomorrow you may find one."

"Oh, yes, zere is ze Cornell here; ze Cornell; ze militaire; ze gendarme; ah, ze gendarme of ze headquat; ze gendarme; ze Cornell Swats."

"Well," said the Colonel, "there's nobody here of that name, and I don't know what you want. I'm Colonel Swords."

"Ah, zat ees eet," shouted the Frenchman, "zat ees eet, Cornell Swats; you are ze man," and a great light dawned on the Colonel.



ORNAMENTAL ARC LIGHT POLE, WILLOW GROVE PARK, PHILADELPHIA.—MORRIS, TASKER & CO.

An Ornamental Arc Light Pole.

The illustration on this page shows a very handsome and serviceable type of arc light pole, erected in Willow Grove Park, Philadelphia, for the Union Traction Company, by Morris, Tasker & Company, of Philadelphia. This well known firm manufactures a large number of varieties of electric railway and light poles of serviceable and artistic design. In the example illustrated, the light from the arc lamps is thrown down by a novel type of reflector, and a platform with a hand-rail is provided for the convenience and safety of the trimmer.

ELECTION CONGRATULATIONS.

NUMEROUS MESSAGES OF REJOICING RECEIVED AT THE OFFICE OF THE "ELECTRICAL REVIEW."

It is not often that a technical journal takes sides in politics, but during the remarkable campaign just closed the ELECTRICAL REVIEW did not hesitate to array itself on the side of honest finance as represented in the Republican platform and in the candidate, Major William McKinley. The words spoken by the REVIEW were widely quoted, and large editions were circulated throughout a number of the doubtful States, covering the interests of which the ELECTRICAL REVIEW is an earnest exponent.

On Tuesday night, after the triumph of the principles espoused became absolutely certain, the ELECTRICAL REVIEW sent congratulations to a few of its friends throughout the United States. To publish the responses would fill the entire paper, and we dislike to omit any. We present a few, however, from different sections, and we are sure they will be of interest to our readers in general. The message sent was as follows:

We extend election congratulations. May increased prosperity be your portion.
ELECTRICAL REVIEW.
New York, 10.20 P. M., November 3.

Responses.

FROM A BROTHER PUBLISHER.

I am in receipt of your telegram of congratulations, for which I thank you. The good work that the ELECTRICAL REVIEW did among the street railway and other electrical people during this past campaign was not unnoticed by me. Doubtful States, without doubt, were helped into line by your efforts. W. J. ARKELL, *Judge*.
New York, November 4.

WITH HOPES OF BUSINESS.

We appreciate your enterprise and thoughtfulness in the telegram you sent us, and we return your congratulations, and would say that we feel ourselves the subjects of congratulations, as every other concern with hopes of business must feel after this election.
MANNING, MAXWELL & MOORE.
New York, November 4.

WHAT ONE WORD DID.

The news is just glorious! It could not be better, and, especially, to those who advocated, many weeks and months ago, the adoption of the word "gold" in the Republican platform.
B. ARKELL, *Leslie's Weekly*.

"PROSPERITY IN EVERY SENSE."

Your telegram of the 4th instant received,

and thank you very much for your congratulations. We wish you prosperity in every sense. MORRIS, TASKER & COMPANY,
H. Cheston Vansant, Secretary.
Philadelphia, November 4.

REJOICE OVER THE RESULT.

Your telegram of yesterday's date received this morning. Congratulations and goodwill heartily reciprocated. May the ELECTRICAL REVIEW prosp r and the electrical business be much benefited by yesterday's election. We rejoice in McKinley's election. ELECTRIC ENGINEERING AND SUPPLY CO.,
H. J. Gorke, Secretary and Treasurer.
Syracuse, November 4.

CONGRATULATE THE WHOLE COUNTRY.

We received this morning your telegram extending election congratulations. We think we may return the compliment, and congratulate you and the whole country on the way things have turned out, and think we may look for an era of prosperity such as we have not seen for the last three years, to say the least. We thank you for remembering us.
THE EDDY ELECTRIC MANUFACTURING COMPANY,
A. D. Newton, Secretary and Treasurer.
Windsor, Ct., November 4.

HEARTILY RECIPROCATE.

We acknowledge, with thanks, your telegram of congratulations upon the election results and the good wishes therein contained, which we reciprocate most heartily.
WHEELER REFLECTOR COMPANY,
Elbert Wheeler, Treasurer.
Boston, November 4.

RETURN BEST WISHES.

Acknowledging receipt of your telegram, allow us to return your congratulations and best wishes. J. JONES & SON.
New York, November 4.

GOOD FOR WATERBURY.

Thanks for telegram. Waterbury claims part of victory. One thousand for Cleveland in 1892, 1,200 for McKinley in 1896.
NEW ENGLAND ENGINEERING COMPANY,
A. O. Shepardson, Treasurer.
Waterbury, Ct, November 4.

THE GLAD HAND.

Shake! GEORGE A. REDMAN.
Rochester, November 4.

CHICAGO REJOICES.

We reciprocate heartily your congratulations.
METROPOLITAN ELECTRIC COMPANY.
Chicago, November 4.

NO MORE 50-CENT DOLLARS.

We have your telegram of congratulations on the results of the election, and you will please accept ours also. While we were hopeful for a Republican election, and felt confident, we were not looking for any such landslide, and we think the silver advocates have received a good lesson, and it will be a long time before they can make any attempt to give us a 50-cent dollar.
S. MORGAN SMITH.
York, Pa., November 4.

BLISS HAPPY, OF COURSE!

We are in receipt of your telegram of the 3d instant, with congratulations, for which we thank you and reciprocate.
E. W. BLISS CO.,
W. A. Porter, Secretary.
Brooklyn, November 4.

SO BE IT.

Telegram received, and we can only say, Amen.
PARTRICK & CARTER COMPANY.
Philadelphia, November 4.

BEGINNING OF GREAT PROSPERITY IN THE ELECTRICAL BUSINESS.

Congratulations received. I consider McKinley's election the beginning of great prosperity in the electrical business.
S. H. SHORT,
Walker Company.
Cleveland, November 4.

IMPROVEMENT SURE TO COME.

We are overjoyed with results for honest money and restoration of confidence. We don't expect a sudden revulsion of trade, but it will come, and we have no doubt the ELECTRICAL REVIEW will have its abundant portion. CENTRAL ELECTRIC COMPANY,
D. E. Goe, Manager.
Chicago, November 4.

CUTTING PRICES SHOULD END.

Your telegram is at hand, and thank you for your kind wishes and election congratulations.
Now that sound money is indorsed and confidence revived, it will lead to restoration of business. With increase in business I trust that the close competition and cut prices may, in a measure, end. I trust the trade and business houses will consider the matter, as none of us is in business for his health, and, if we were, do not think we should gain much in flesh or in pocket
EASTERN ELECTRIC CABLE COMPANY,
Henry A. Clark, Treasurer.
Boston, November 5.

MANUFACTURING INDUSTRIES WILL PROFIT.

We are in receipt of your telegram congratulating us on the success of Major McKinley as President of the United States, which we truly believe is a victory in more than one sense of the word.
We are very much pleased at the outcome, and have not the slightest doubt but that he will give us an administration of which the country may be proud.
We are very confident that the manufacturing industries of the land will profit by his election, and as per your telegram, we certainly will share in our proportion of the increased prosperity.
Wishing to thank you very kindly for remembering us as you did, we beg to remain,
THE LAKON COMPANY,
John C. Boss, President.
Elkhart, Ind., November 4.

INCREASED PROSPERITY SURE TO COME.

We are in receipt of your message extending congratulat ons upon the election, for which kindly accept our thanks. We trust that, now this agitation is settled, we may note increased prosperity in all branches of the electrical trade. This, we think, is sure to come. Possibly slowly at first, but with increased force when the Spring trade opens. Extending to you our congratulations for the magnificent manner in which New York displayed her patriotism, we are,
THE VALENTINE-CLARK COMPANY,
E. L. Clark, Secretary.
Ch'cago, November 4.

SIGNS OF REVIVAL ALREADY MANIFEST.

Thanks for your timely telegram. I reciprocate your good wishes most heartily. Now that our voters have declared for honest money, upheld National honor and repudiated anarchy, we may confidently expect a general revival in business. Signs of this are already manifest in our portion of the field.
Hoping you will reap the reward of your progressiveness,
STANDARD AIR-BRAKE COMPANY,
E. J. Wessels, General Manager.
New York, November 5.

We wish to acknowledge the receipt of your telegram of congratulation over the election, and thank you for the kind words contained therein, regarding our work in the canvass. This has really been very little, but we hope that it may have had some good effect. We appreciate your reference to it in a recent copy of the ELECTRICAL REVIEW.
We think that you yourselves deserve a great deal of credit for the strong stand you took in your editorial columns, and also for the amount of personal work done in connection with the parade of last Saturday. We think that the success of the electrical portion was very largely due to the timely interest which you displayed.
Very respectfully,
WHITE-CROSBY COMPANY,
G. H. Walbridge, Secretary.
New York, November 5.

I extend to you the same greetings conveyed in your telegram of yesterday.
JULES VIENNOT.
Philadelphia, November 5.

INCREASE IN BUSINESS EXPECTED.

We thank you for your telegraphic congratulations, and we trust that we may have an increase in business.
WESTON ENGINE COMPANY.
Painted Post, N. Y.

New Home for the Engineers' Club.

The Engineers' Club, of New York city, to which many electrical men belong, has secured a new club house on Fifth avenue. The club has leased for 10 years and four months the house at 374 Fifth avenue, until recently the home of Mrs. C. A. Drayton. Extensive improvements to render the house suitable for club purposes will be made.

The Court of Appeals has ordered a reargument in the appeal of the Manhattan Railway Company, of New York city, against an assessment by the New York City Tax Commissioners for 1895, by which the capital stock and surplus of the company were assessed at $16,496,995.

THE ELECTRICAL SOUND-MONEY CLUB.

HOW THE CLUB WAS FORMED, ITS OFFICERS, AND THE PART IT TOOK IN THE RECENT SOUND-MONEY DEMONSTRATION IN NEW YORK CITY.

The appearance of the 2,000 men who marched in the sound-money parade in New York city on October 31, under the banner of the Electrical Sound-Money Club, has created so much favorable comment that it may be interesting to know a little of the circumstances under which the club was formed. The idea of having the electrical trades parade in a division by themselves was conceived by Mr. Charles Blizard, New York manager for the Electric Storage Battery Company. The question of forming the Electrical Sound-Money Club was taken up just a week before the day of the parade, and after three days' work, the club was formed under that name with the following officers: President, Gen. E. S. Greeley, of The E. S. Greeley & Company; vice-presidents, U. N. Bethell, general manager New York Telephone Company; A. S. Brown, electrical engineer of the Western Union Telegraph Company; F. A. Pickernell, electrical engineer of the American Telephone and Telegraph Company; S S. Wheeler, of the Crocker-Wheeler Electric Company; F. W. Jones, electrical engineer of the Postal Telegraph-Cable Company; Charles Blizard, of the Electric Storage Battery Company, and A. L. Salt, of the Western Electric Company; secretary, Stephen L. Coles, of the ELECTRICAL REVIEW, and treasurer, W. L. Candee, of the Okonite Company, Limited. The formation of the club was completed four days before the parade, and Gen. C. H. Barney, of the New York Telephone Company, was selected as marshal of the electrical brigade. Headquarters were secured in the large store at the southwest corner of Liberty and Greenwich streets, where General Barney established his offices. Arrangements were made for the electrical brigade to form the third division of the metal trades' portion of the parade, under the command of Colonel Manning, of Manning, Maxwell & Moore. It was found that several electrical concerns had already allied themselves with the metal trades and other organizations which had already secured positions in the line of march. Through the courtesy of these other organizations, especially the metal trades, all the electrical concerns were transferred to the electrical brigade.

On Saturday morning, the day of the parade, General Barney and his efficient staff of aides had laid out the formation of the brigade in Greenwich street, fronting on Liberty, and had assigned to every company its proper position in line. The start was made promptly on the scheduled time, at 2.40 P. M., and the line of march was covered in a little over two hours. There was not a single hitch in any of the military arrangements, for which great credit is due General Barney.

Following the marshal, at the head of the brigade, were the officers of the Electrical Sound-Money Club and the marshal's staff of aides. After them came the club banner, followed by the Long Branch Military Band. The first regiment was formed by the 430 employés of the Crocker-Wheeler Electric Company, under the command of Col. Schuyler S. Wheeler. The second regiment was in command of Col. Frank M. Anderson, and was headed by a drum corps. It was composed of 250 men from the New York Telephone Company, Southern Bell Telephone Company, American Telephone and Telegraph Company, and the Consolidated Telegraph and Electrical Subway Company; 110 men from the Safety Insulated Wire and Cable Company; 50 men from the Western Union Telegraph Company, and a considerable number in smaller groups from other firms The third regiment was in command of Col. Charles S. Pease, and was headed by a brass band. It was formed as follows: 250 men from the Interior Conduit and Insulation Company; 75 from the E. S. Greeley & Company, and others from the Okonite company, White-Crosby Company, Tucker Construction Company, Diehl Manufacturing Company, Electric Storage Battery Company, Conduit Wiring Company, Electrical Engineering and Supply Company, and other firms. The fourth regiment was headed by a drum and bugle corps, and was in command of Col. C. F. Nichols. It was made up of 350 men from the Western Electric Company, and others from the Phœnix Interior Telephone Company, etc. The total number of men marching in line was 1,832.

The music furnished by the Long Branch Military Band was of a high order. The drum and bugle corps at the head of the fourth regiment was the famous Rankin Post Drum Corps, which, besides furnishing excellent music, amused the spectators, according to the New York *Herald*, by "performing various evolutions on the march, forming into crosses and hollow squares and straightening out again, without ever a faulty pipe or a wrong tap." The employés of the E. S. Greeley & Company carried incandescent lamps mounted on the end of their flag canes. The electrical brigade followed the latest United States Army drill regulations and marched past the reviewing stand with flag canes at "port arms." No other companies, so far as known, did this, and it evidently caught the fancy of the spectators, judging from the applause on both the grand stands. General Barney carried, as marshal's baton, a very handsome cane with a massive, diamond-studded, solid gold head, which was presented to him by the fleet of the Electric Launch Company at the World's Fair. The Interior Conduit and Insulation Company's men carried canes made from brass armored conduit.

Marching in close order, four paces between companies, the electrical brigade was a little more than a quarter of a mile long. If it had been in strictly military formation it would have extended over four-fifths of a mile.

Considering the large amount of work involved in the formation of the Electrical Sound Money Club and in the military preparations required to place the brigade in marching order, great credit is due to every one who had a hand in the work, especially when it is borne in mind that it was all done inside of one week.

THE TELEPHONE ON ELECTION DAY.

HOW THE RETURNS WERE SUCCESSFULLY AND PROMPTLY SENT OUT TO THOUSANDS OF SUBSCRIBERS.

The New York Telephone Company and the American Telephone and Telegraph Company (Long-Distance) on the evening of Election Day gave their subscribers and the general public a striking demonstration of the convenience and rapidity of the telephone service. On the occasion of every recent election the long-distance telephone system has done remarkably rapid work in the collection and distribution of returns all over the country. This year, appreciating the feverish interest and excitement of all classes of the community, and the general eagerness for early information, the New York Telephone Company took advantage of the very complete and elaborate arrangements made by the Long-Distance company and organized a special service for distributing the returns, as rapidly as they came in, to telephone stations throughout the city.

This special service was a work of considerable magnitude, as the idea, broached only a week before election, met with immediate acceptance on all sides. It was divided into three classes—first, the distribution of returns to hotels and clubs which had previously arranged to take the service; second, to groups of subscribers who had signified their willingness to give up their lines for the purpose during the evening; and third, the equipment of a number of special telephones, manned by operators provided with bulletins, to which all inquirers by telephone were connected as soon as they stated their wishes to the operators who answered their calls.

The entire work was carried out by a special staff of employés drafted from the various offices and departments of the company, the regular operating staff being left to carry on the regular operation of the service the same as at ordinary times.

The main service was operated at Cortlandt street, where a large number of special telephone instruments had been installed to carry on the work of receiving and distributing the news. Practically an entire floor of the building was given up to the work. Lines of long-distance telephones stretched down the corridors on either side of the building, and the rooms on each corridor were filled with more telephones, with typewriters manifolding bulletins, editors compiling the returns, and statisticians checking the figures with those of 1892.

The entire work of collecting and receiving the news was performed by the Long-Distance company. Direct lines from all over the country served by the long-distance system were connected up between the principal points where the returns would be available the earliest and the receiving telephones just referred to. So thoroughly were all the doubtful and hotly contested States covered by the Long-Distance company's organization, that as soon as the figures were known at any point they were being read out over the lines to New York and copied down at Cortlandt street, whence they were immediately dispatched again to all the important places reached by the long-distance lines. Besides the numerous lines to other telephonic centers, the Long-Distance company had installed lines directly to the houses of Major McKinley, Mr. Hobart and several other prominent statesmen.

The scene at Cortlandt street was a lively one throughout the evening. Soon after seven the work was at its height. More than 100 persons were occupied in receiving, editing and forwarding the bulletins, which multiplied like snowflakes on a January afternoon, as the evening wore on. As soon as a bulletin was received by an operator at one of the incoming telephones, a messenger flew with it to the editing and manifolding room, and a few moments later half a hundred copies were distributed to as many telephones, and the cheering figures were being spoken to all points of the compass, being thus simultaneously communicated to vast crowds in every direction.

The hotels and clubs receiving the first service organized by the New York company were connected in groups of four directly to telephones in a room at Cortlandt street immediately adjacent to the editing department, and the bulletins were read out to each group as fast as they came in. At the receiving ends of the lines in the hotels and clubs were two or three telephone employés who took down the returns and copied them out on large sheets, which were hung up in conspicuous places, where they were eagerly scrutinized by the assembled crowds. So rapidly did the service work, that where it was possible to compare the telephoned returns with those received by telegraph, it was evident that the former were fully half an hour in advance of the latter. This was due partly to the greater speed of transmission natural to spoken words as against signals, and partly to the perfection of the arrangements for handling the bulletins by telephone.

The second service, for distributing the returns directly to subscribers, was handled from each exchange. At 5 o'clock in the evening the exchange ends of the lines of the subscribers who had requested to be supplied with the service were connected in groups of 20 to special telephones, at which an operator was seated to read off the bulletins as they came in over direct wires from Cortlandt street. Some 350 subscribers' stations in New York city received the news in this way, and these stations probably represented an audience of 18,000 to 20,000 people, for each subscriber who had arranged for the service had invited all his friends to come and hear the election news hot from the wires, so that parties of 50 or 60 people were assembled at every house taking the service. This branch of the arrangements went off with entire success. Indeed, so full and complete were the returns received, that the various private gatherings had no time for anything else but to listen to the returns. Most of the hosts had provided music and other entertainment to while away the intervals they expected between the bulletins, but so rapidly did the news come in—one bulletin after another in quick succession—that extraneous entertainment was quite at a discount. Without exception, the subscribers and their friends were highly delighted with their experience, and the New York company received, the day after election, many warmly complimentary letters of thanks.

The third branch of the service, to provide for miscellaneous calls from any part of the system, was carried out by equipping 50 special telephone lines connected to the Thirty-eighth street switchboard and to instruments placed in a long room in the Thirty-eighth street telephone building. At each telephone was an employé who was kept constantly supplied with the latest bulletins. The operators at all the different exchanges were informed of the numbers of these special lines, and when an operator received an inquiry regarding the elections, she immediately connected the inquirer to one of the special lines in precisely the same manner as she would make an ordinary connection. The employé at the telephone would then answer the inquiry, and give specific information from the bulletins before him. Over 1,500 subscribers and others were served in this way during the evening, and many of them were agreeably surprised at being able to promptly obtain the latest news of the election by the simple expedient of a telephone call.

At the main receiving and distributing point at Cortlandt street, more than 1,200 separate long-distance bulletins were received, edited, culled, compared and sent out between 6.30 in the evening and 1 in the morning. General Manager E. J. Hall was present in person, overseeing the work. The local returns were all telephoned from the various precincts to separate telephones at Police Headquarters, and from there telephoned on to Cortlandt street. Other distributing lines not previously mentioned were those to Brooklyn, Jersey City and Yonkers, from which places the returns were again telephoned on to neighboring towns, to hotels, clubs, and to groups of subscribers in Long Island, the northern part of New Jersey and throughout Westchester County.

It is interesting to note that the technical arrangements specially made for the service performed by the telephone company in New York worked without a hitch. To minimize any interference with the general service—although this was likely to be little used on Election Day—the numerous direct connections and groupings of lines were not made until after 5 P. M. on Tuesday, and everything was restored to its normal condition before 8 A. M. on Wednesday. To provide against breakdowns, detachments of the company's maintenance force were held in readiness at various points to attack promptly any trouble that might develop. But they had absolutely nothing to do, as the whole thing worked like a charm.

The thoroughness and stability of the arrangements, the remarkably smooth and rapid working of the services organized at such short notice, speak volumes for the willingness and high efficiency of the New York Telephone Company's staff, who threw themselves into the novel work with a zest that assured the success of the enterprise from the beginning. There could be from the nature of the case no rehearsal beforehand. It was a case of hit or miss. And all within range of the telephone on Tuesday night agreed that it was a most decided, palpable hit, and the ELECTRICAL REVIEW extends its congratulations.

THE NEW YORK & NEW JERSEY TELEPHONE COMPANY.

General Manager W. D. Sargent, of this company, arranged to supply the election returns throughout the territory of his company. The result was extremely satisfactory. At the headquarters of the company, in Smith street, Brooklyn, the news was received and announced by Treasurer Snow and General Superintendent Reilly to an assembly of invited guests, who spent the evening as pleasantly as at a parlor reception. Refreshments were served at the proper hour. The officials of the company were the recipients of many congratulations over the success of this "telephone party" when it broke up about midnight.

Among those present were the hosts, Vice-President and General Manager William Dunlap Sargent, Henry Sanger Snow, treasurer; J. C. Reilly, general superintendent, and J. L. Hamar, auditor, and their ladies, and Mr. and Mrs. Wm. Berri, Hon. Felix Campbell, Mr. and Mrs. Chas. T. Young, City Auditor Sutton, Deputy City Auditor Quimby, Mr. and Mrs. George H. Prentiss, Mr. and Mrs. Alexander Cameron, Mr. and Mrs. Clinton L. Rossiter, Mr. and Mrs. Willard L. Candee and Miss Candee, David P. Powell, Dr. and Mrs. Tieste, Prof. George W. Plympton, Mr. and Mrs. Daus.

Major McKinley and the Telephone.

During the height of the excitement of receiving the returns on election night, one of the newspaper bulletins started the rumor that Major McKinley had been shot. This rumor found its way rapidly to telephone headquarters at Cortlandt street, where, as described on this page, a direct telephone line was operated to Major McKinley's home at Canton. It was just about the time when favorable returns were coming in from some doubtful parts of the country, and the people's choice was at the telephone himself. The bulletin was handed to the operator, who interrupted the reading of the bulletins to say:

"Mr. Next President, there's a rumor going about in New York to the effect that you have been shot." A hearty laugh came back over the telephone and the happy candidate said: "Is that so. Who shot me?"

"I thought I heard nothing," said the operator, "and went on reading McKinley pluralities."

Reduction in Price of Interior Conduit.

As will be seen in our columns elsewhere, the Interior Conduit and Insulation Company, of New York city, announce a reduction in the prices of their well known brass armored insulating conduit, elbows and couplings. The enormous sales of this material during the past year have reduced the cost of production; hence the reduction in price.

This company will shortly place upon the market a new and improved iron-armored conduit, full particulars of which will soon be given.

KIND WORDS.

"WOULD NOT MISS IT."

TO THE EDITOR OF ELECTRICAL REVIEW:

Kindly forward my ELECTRICAL REVIEW to address given below until further instructions, as I have removed from Akron, Ohio, to this city. I would not miss one issue of it for double the cost.

Respectfully yours,
G. B. KECK.

Mt. Vernon, October 31.

THE SELECTION AND MANAGEMENT OF EMPLOYEES.

READ BY W. F. KELLY, OF COLUMBUS, OHIO, BEFORE AMERICAN STREET RAILWAY ASSOCIATION, ST. LOUIS, OCTOBER 20, 1896.

"It is a good divine that follows his own instructions; I can easier teach 20 what were good to be done than be one of 20 to follow mine own teaching."

The writer lays no claim to being wiser than his generation, nor to have discovered new and startling facts in humane experience. He does not presume to instruct veterans in street railway management, but merely offers for your consideration some stray chapters from the book of experience. Nor is the experience necessarily personal. Much of it is gathered from observation and inspection in a dozen different cities. The suggestions which follow are not specifically *what* to do, but rather what *not* to do.

An intelligent consideration of a man as an operative presupposes a knowledge of the conditions and environments under which the operative exists. What these conditions are, or seem to be, depends largely on the point of view. The public view it from one point, the employés from another, the manager from a third, and the stockholders or owners from still a fourth. From these various points of view arise the complex relations of the street railway to the general public and to its employés. The manager is doubtless familiar with the view of the stockholders, whom he directly represents, but he is too frequently unfamiliar with the view of the general public, whose patronage he seeks, or with that of the employés, whose services he receives.

To the public mind a street railway is the visible, tangible property with which they are in daily contact, and the intangible, shadowy something which they call the management.

The physical character of the property they judge of by observation. The management they judge by the character of the employés with whom they are in daily contact. In a large system, perhaps not one in 20,000 have ever seen the president. The mild-mannered, long-suffering manager, known and beloved by his friends and neighbors for his many kindly virtues, is too frequently in the public mind the embodiment of all that is selfish, cold-blooded and rapacious. If the common talk of the every-day world is to be believed, he delights in irritating and insulting the public, in the oppression and abuse of his employés, and is always endeavoring to rob the people or the city of their rights.

How does such an impression become current? Perhaps through the publication of his official acts, and partly through the men employed on your cars; not that they willfully malign the management, or openly condemn or criticise it, but by their conduct and bearing toward the traveling public they unconsciously create this impression. The president, manager and entire directory may be the most capable and eminent business men in the city, the personal character of every one above reproach, and yet, collectively, they are powerless before that common, final tribunal, public opinion. The street is the forum and the street car the tribunal from which emanates public opinion. The employés reflect the character of the management, and, whether we wish or not, the public consider the car employés, with whom they are in daily contact, as representing their policy and attitude toward the public. We touch the public, and have our measure taken largely through the men who man and operate your cars.

The average American enjoys a "kick," and, unfortunately, the operation of a street railway system offers abundant opportunity for the exercise of this glorious privilege. The conductor or motorman affords the readiest victim, and the kicker enters up judgment on the management according to the manner in which the innocent employé receives and disposes of his kick.

The pernicious idea that anybody can run a street car has, in the past, resulted in the employment of an army of careless, coarse and incompetent men, who, through their ignorance, carelessness and incivility, have done more to bring street railways into public disfavor than all the official acts of its management and directory.

The manufacturer selects his salesmen, not on account of his knowledge of his wares, but more largely on account of his ability to meet and treat courteously and kindly present and prospective customers. The merchant insists that his clerks should be courteous, diplomatic and obliging, as well as honest and faithful. We may not know either the merchant or manufacturer, but we judge them by their agents and their salesmen.

In the commercial world, the merchant, banker or manufacturer thinks it of enough importance to personally take great care in the selection of his representatives; the average street railway management is content to leave this most important matter to an overworked, underpaid subordinate, with but a limited conception of the essential qualities of a first class employé.

The management has time to discuss a fare register, a sand-box or a truck, but hasn't an hour to give to the choosing of his public representatives. The selection of the human machine, which is far more important, more difficult to understand, more difficult to operate, causes the most trouble and expense, and fails most frequently, is too often intrusted to a man already burdened with many details.

The manager thinks it essential to have a competent, well paid man to purchase necessary supplies. If cars, motors or power station machinery are to be purchased, he gives it careful, personal attention, and calls to his aid skilled experts, in order that there be no error in so important a matter.

But the employment of conductors, motormen, inspectors, foremen, etc., the working force who earn and waste your money, who make your system popular or odious with the public, who operate yours skillfully and safely or awkwardly and dangerously, who keep your repair and accident account at a minimum, or make them a heavy burden, who collect and account for all of your earnings, or filch a portion for their personal use, this large body of men, the very life-blood of your system, you leave to the selection and care of some one whom you wouldn't trust to buy a street car or select an office boy.

The purchase of supplies, equipment or station machinery are all important matters, and should be carefully considered; but the selection of 50 or 100 men of the *wrong* kind is far more important and more expensive than a dozen blunders in the purchasing department.

Every employé of a street railway should be considered as an agent with possibilities of harm to his employer. It is not enough that he is intelligent, sober and industrious. He should be of good judgment and sound thinking, and neither communicative, socialistic or anarchistic in his views; not discontented and at cross purposes with the whole social order, but of cheerful disposition and content to make the best of life as he finds it.

The physical and intellectual qualities of the applicant should both receive careful consideration. Well-bred, sound, vigorous men, with a fair common-school education, can be readily secured, and the wide-awake management should be satisfied with nothing less. In order to exclude many undesirable applicants, a high standard of physical qualifications should be established and adhered to rigidly. Certain previous occupations are considered as disqualifying. Policemen, firemen, steam railroad employés, political appointees, are, as a class, undesirable. There may be individual exceptions, but they are rare.

Friends or relatives of the directory or other company officials, relatives or political friends of city officials, brothers or near relatives of present employés, are most frequently inefficient and troublesome. They are a dead weight on the neck of the active manager, and no matter how excellent the reason, every dismissal involves an explanation, and frequently ill feeling on the part of those who have been favored by having their friends appointed. Fitness should be the sole standard for securing a position. The manager should have no favorite or relatives on his force, and should be wholly untrammeled by his directory or superior officers. Either he is large enough to discharge the duties of his office without suggestion as to details, or else the property needs a new manager.

In large systems the duties of general manager are so numerous that he thinks it impossible to devote his time to the employment and discharge of conductors and motormen. Then by all means relieve him of many of these. Plenty of competent men can be found to purchase materials, jolly the council, place insurance, adjust damage claims, etc., but few men have the clear judgment and broad mindedness to select the best class of men for their service and to deal fairly, firmly and kindly with their faults and failures.

No class of public service is more exacting than that of the street-car employé. In no other business do the public get so much for their money and grumble so much because they don't get more. In no other business is the employé so much the personal representative of his employer as in this. What do we expect and require of him? That he always be prompt in reporting for duty; always quick and accurate in the various details of his business; honest, sober, intelligent, trustworthy, clean, courteous, smiling, patient, good-natured, never weary, always ready to help everybody, always obedient to several dozen or hundred rules; in fact, a model of all the virtues, for $2 a day. Desiring all these, there are some managers who require yet more. I have in mind one prominent city road, in which nearly all the employés are of one religious belief, and others find it difficult to secure employment. Another, in which all employés are opposed to this belief; and yet another in which they are almost wholly of foreign birth or parentage. In the first two cases, this condition arises largely from the personal prejudice of the manager, and in the other through a mistaken notion of economy. It is fair to assume that neither of these managers is of that broad-gauge type which places high character and efficient service above political or religious creed.

Granting that there has been careful and intelligent selection, it is equally important that there be wise and considerate management. Rules applicable to individual conduct are not necessarily applicable to men as a class. The class is above the individual and the rule must be adjusted to meet the average requirements. Many of the rules in existence to-day are the heritage of the old days when the street-car employé was "something better than his dog, a little dearer than his horse." Rules were then made to meet the exigencies of the case and in accord with the duty and character of the employé. Frequently the only rule was the whim of the foreman or "barn boss." In time, various miscellaneous practices crystallized into custom and finally became a well settled practice.

The electric motor and the cable ushered in the new era of city surface transportation. New blood and new capital entered the field, but many of the old customs and old employés remained. The change from animal to mechanical traction has been swift and startling. In many places the horse car is but a memory and the mule driver is an extinct species. Track, cars and power station up-to-date, but the method and management of the men who operate the cars is that of the past decade.

It is conceded that a different type of men is necessary, and on various systems there has been a noticeable change since the horse-car days. True to natural law, the fittest have survived and a superior class of men now operate the cars. There has not been on the part of managers in all cases so marked an improvement in the modification and amelioration of various harsh practices. It is urged that the more intelligent, superior type of man is deserving of better treatment than the mule whacker of 10 or 20 years ago. Frequent and severe punishment for petty offenses should be abolished, and a code of rules established worthy of the men and the business they represent. The almost universal practice in punishing minor offenses is to "lay off" the employé from one to ten days, without pay, which is in effect a fine of from $2 to $20. The man is soured, his family suffers from the loss of earnings, and if the man happens to be a conductor, it is not surprising if he tries to *get even* by nipping fares. The practice is still adhered to by many railway companies, and the offenses which the punishment is supposed to correct still continue. Such a practice would not be countenanced in a manufactory, a store or in commercial affairs; why should it be on street railways? If the man is valuable enough to be retained in service, why should his family suffer the loss of his wages? If the man were permitted to continue at his work, and one-half the amount he would lose by laying off were assessed as a cash fine, the practice would be condemned in unmeasured terms both by the press and an indignant public. If employés are not amenable to reprimand administered in a proper way, they have not your welfare at heart, and should be dispensed with altogether. An entry, together with date, should be kept of all occurrences connected with every employé. It should show his absence from duty, whether from sickness or other cause, his various little lapses from duty, disobedience or neglect of orders, etc. This record should be frequently examined by the manager, and when it is evident that the man is making no improvement,

replace him at once without waiting for "something to happen."

All foremen and sub-foremen should be impressed with the idea that all men under their charge should be treated in a gentlemanly manner and with the utmost fairness; that there shall be no favoritism in recommending men for promotion or in shielding them from punishment. Much depends on the integrity and good judgment of the division foreman. It is, therefore, highly essential that there be no mistake in selecting men for these positions. If they are not active, loyal and interested in their work, discipline will be lax and unsatisfactory service the result.

Employés should not be censured for light or trivial causes or on *ex parte* testimony. Reprimand should be kind, but pointed and manly, and never in public or in the presence of his fellows. Deal fairly and justly with every man, and teach the man to feel that his case will receive careful, unbiased consideration, and that for similar offenses the same and certain punishment will follow in all cases.

Drinking on duty, drunkenness, frequenting saloons or gambling rooms, or association with loose women, are all inimical to good service and merit dismissal.

Revise your rule book and eliminate all useless and harsh rules, and insist on a strict observance of the remainder. Study it and see if many old customs should not be abolished and new ones inaugurated. Put yourself in the employés place and see how many of them you think are necessary in order to secure efficient service.

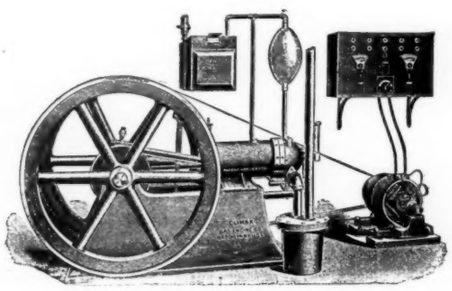
A number of large railway companies have in recent years furnished comfortable and attractive waiting rooms for their men, with reading room, lavatory, etc. This is neither charity nor generosity. It is a plain business proposition that the company will obtain better and more satisfactory service if the men have cosy and attractive quarters about the car houses. The manager too frequently thinks that, when he has done all this, his men have no cause for complaint and that they are ungrateful and unappreciative. Let him look beneath the surface and discover the cause of the irritation. He will probably discover that somebody or something is not receiving fair play; that there is some discrimination in promotion, punishment, hours of labor, etc. The grievance may be only imaginary, but until it is considered and adjusted, it creates grumbling and discontent as surely as a real one. To obtain the best service, there must be a feeling that the manager has a personal interest in the welfare and success of his men. Prizes for good conduct and satisfactory service, beneficial organizations, reading and recreation rooms are all hopeful and in the right direction, but courteous and manly treatment, and a kind word now and then, smooth away the irritations of an exacting service more than all else. The man must feel that you respect his manhood, integrity and fidelity; that aside from his service as an employé you have a human interest in his success as a man. He has a right to feel that years of right living and faithful service entitle him to your confidence, and that his good character should shield him from evil report.

Improved conditions, shorter hours of labor and better wages have all contributed to make street railway service more desirable and attractive to a high class of labor. Formerly it was considered that street railway men were necessarily a shifting, thriftless class, whose term of service was of brief duration. Street railway managers seemed to think it a part of the daily programme to discharge somebody or employ somebody—anybody—in his place. Men looked upon it as a makeshift job—a chance to pick up a few dollars while waiting for something better to turn up. The result was a miscellaneous aggregation of men, with no higher interest in the welfare of their employer beyond receiving their wages. Happily, this condition is fast passing away, and the best street railway systems to-day are those which have given most care and attention to the selection and treatment of their men.

We may never reach that ideal condition where every man is capable, honest and trustworthy. It is none the less worth striving for, and the manager who most nearly approaches it has within his grasp the highest elements of success. With the whole body of employés loyal, faithful, intelligent and devoted to their duty, gross earnings would be increased and operating expenses diminished, personal injury claims be reduced to a minimum, secret service agents no longer necessary, the occupation of the labor agitator gone, the kicker silenced, and that peace of mind of which the general manager now only dreams will become a reality.

Exhibition of Climax Gas Engine.

The illustration herewith of gas engine, with gas meter, voltmeter and ammeter attached, shows the method of exhibiting the Climax



CLIMAX GAS ENGINE, SHOWING VOLTMETER, AMMETER AND GAS METER.

gas engine, manufactured by the Climax Gas Engine Company, 31 Fulton street, Brooklyn, N. Y., described in a recent issue of the ELECTRICAL REVIEW.

In addition to the results of the actual tests of this form of engine as spoken of, it may be of interest to add for those who are interested in the development of the gas engine, that estimating the wattage output at nominal, which is always less than the actual, it is evident that the wattage output would equal 81 by 54 (considering a bank of 81 lamps to be 54 watts), or 4,372 amperes for 210 feet of gas per hour. Comparing this with the original statement of the efficiency of this type of engine of 50 cubic feet per kilowatt hour, it is evident that the actual consumption is only about 46 feet per kilowatt hour.

A test of 81 lamps, upon which the figures were taken for the article published, was a test of the minimum, and not the maximum, efficiency of the engine, as the following day, when the gas pressure was greater, the same engine operated 96 three and one-half ampere lamps, consuming at the rate of 225 feet of gas per hour.

ELECTRIC LIGHT FLASHES.

The Pawtucket, R. I., Electric Company will increase its plant by the addition of two more dynamos, making five in all.

The Hyde Park Electric Light and Power Company, of Chicago, Ill., will issue $200,000 six per cent bonds, one-half to be used for extensions.

Bernard Mooney is suing the Narragansett Electric Lighting Company, of Providence, R. I., for $10,000 damages for an injury received at their works.

The Bay City, Mich., Iron Works, of which George W. Watts is president and Leslie F. Fogg, secretary, has been attached by the Edison Light and Power Company for lights furnished during the past eight months.

The Ohio State convention of electric light managers, held at Springfield, Ohio, elected John I. Beggs, of Cincinnati, president; G. S. Long, of Troy, vice-president; Samuel Scoville, of Cleveland, secretary and treasurer.

The plant of the Morrisville, N. Y., Electric Light Company, at Eagleville, one mile South of this village, has been totally destroyed by fire. The fire is believed to have been of incendiary origin. The loss is about $40,000. There is no insurance.

The directors of the Edison Illuminating Company of Easton, Pa., who were elected recently, have organized by the election of N. P. Cornell for president; Fletcher H. Knight, vice-president; Howard Rinek, secretary, treasurer and general manager.

The committee appointed by the Borough Council, of Pottsville, Pa., to inquire into the advisability of the borough erecting its own electric light plant has reported against such a movement. The committee finds that the probable cost of erecting a 150-arc plant would be from $35,000 to $40,000 complete.

At the annual meeting of the Pennsylvania Heat, Light and Power Company, of Philadelphia, Pa, the following board of directors was elected: William L. Elkins, George Hiller, Martin Maloney, W. W. Gibbs, George P. Graham, Thomas Dolan and John Lowber Welsh. The annual report shows net earnings for the year of about $147,000.

The Kensington Electric Company, of Philadelphia, Pa., by petition of its president, William McIntyre, has asked Court No. 4 for a mandamus to compel the director of the Department of Public Safety, Frank M. Riter, to sign warrants for electric lighting for the months of June, July, August and September, amounting to $11,901.40.

The Redlands, Cal., Electric Light and Power Company have elected the following officers: President, H. H. Sinclair; vice-president, George B. Ellis; secretary, F. G. Ferand; treasurer, First National Bank; directors, H. H. Sinclair, George B. Ellis, James F. Drake, F. P. Mesmore, E. T. Painter, Henry Fisher and F. G. Ferand.

The Electric Power Company's property at St. George, S. I., has been resold by the referee. The purchaser was Paul D. Cravath, in behalf of the Richmond Borough Electric Company, recently organized in the interests of Erastus Wiman. The business has accumulated under the receiver, Albert Boardman, nearly $80,000 in cash, which, with the assets now realized on, will nearly liquidate the indebtedness of the company, and relieve Mr. Wiman of liability as indorser.

OUR CANADIAN LETTER.

DUNDAS, ONT.—The town is to be lighted by electricity.

ROSSLAND, B. C.—The Electric Light and Waterworks Company are enlarging their plant.

PARRSBORO, N. S.—Dr. J. R. Smith has secured from the town certain privileges to put in an electric light plant.

REVELSTOKE, B. C.—Mr. W. Cowan and others give notice of incorporation as the Revelstoke Waterworks, Electric Light and Power Company for the purposes indicated by the name.

WELLAND, ONT.—At a recent meeting of the Town Council it was decided to put in the necessary fire-alarm improvements requested by the Fire Underwriters' Association. The improvements consist of an electric alarm, two chemical extinguishers, a new fire hall and an automatic alarm striker.

KEEWATIN, ONT.—The Keewatin Power Company is preparing to utilize the water power secured through its dam at this place by making a contract for the transmission of 5,000 horse-power to Winnipeg. The company is prepared to enter into a contract for constructing the necessary works in connection therewith.

MONTREAL, QUE.—Work on the Park & Island Railway Company's extension to Lachine is progressing so rapidly that it will probably be completed in less than a month. Negotiations are now in progress for a working agreement with the Montreal Street Railway Company, in order that a through service may be given to Lachine from the center of the city. J. A. C.

Montreal, October 30.

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Special Notice to Advertisers.

***CHANGES** for advertisements must be in this office by Friday noon for the following week's issue.*

***NEW ADVERTISEMENTS** should be in the office not later than Saturday noon to insure publication the following week.*

NEW YORK, NOV. 11, 1896.

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Now, let everybody quiet down and go to work.

Last week—November 1, in fact—the seventeen year contract between the American Bell Telephone Company and the Western Union Telegraph Company expired. This simply means that some $20,000 a month, heretofore paid to the telegraph company, will be turned into the telephone company's treasury to the benefit of the happy stockholders. The rumors that the Western Union company was planning to enter the telephone field have not been substantiated in the least.

THE BUSINESS OUTLOOK.

Now for business and prosperity!

One of the greatest political battles in the history of the United States has been fought and won. A very brief time will serve to heal the breaches between friends of differing political faith, and at once the work of repairing the damage done to our industries by the last few years of business depression will be commenced. The country's honor and credit has been maintained untarnished before the other nations of the world, and we are assured that our currency will continue sound.

The ELECTRICAL REVIEW, from the beginning of the campaign, has expressed itself in no uncertain words as opposed to a depreciated currency. It is not the province of an electrical journal to devote its editorial columns, or any of its space, to the consideration of political questions; but, in the campaign just closed, the issues at stake were so vital and so threatening to the stability of the electrical industry, that it was the duty of every journal connected with our field to take its stand for honor and right. We are proud to say that we led the way and received prompt and ample support from our contemporaries. We are also proud to say, to the credit of the electrical industry, that but one advertiser withdrew his advertisement from the ELECTRICAL REVIEW on account of our political opinions.

The good times for which we have all been waiting for four years have apparently put in an appearance. The ELECTRICAL REVIEW is happy to state that it knows of at least four cases where the election of Major McKinley has put large amounts of money in circulation. A large banking firm in a near-by city had $2,600,000 of its clients' money in hand, to be invested in street railways as soon as McKinley's election was assured. This money has already begun to be invested. A large electrical manufacturing company states that it has on hand enough orders for its product to keep its shops busy for the next 30 days. All these orders were given to the company contingent on McKinley's election, otherwise they were to be considered void. A prominent electrical contractor called at the ELECTRICAL REVIEW office on Wednesday, of last week, and stated that now that it was settled that McKinley was to be our next President, he had started three companies which would not otherwise have been brought into existence. Another electrical manufacturing company reports that its New York office did more business in the first four days of November than it did during September and October, and they were pretty good months, too. Altogether, the outlook is extremely encouraging.

We congratulate the bright and able men connected with the electrical field on their present opportunity to retrieve their fortunes. The future never looked brighter nor more full of promise than it does now. Here's to business and prosperity, and plenty of both!

The General Electric-Westinghouse Patent Commission is moving along smoothly. For an organization evolved from the patent fights and price-cutting contests that had existed for several years, it is somewhat remarkable that it should run along so satisfactorily to all interests. The commission, as our readers know, consists of President Charles A. Coffin and General Counsel Frederick P. Fish, of the General Electric Company, and President George Westinghouse, Jr., and General Counsel Paul D. Cravath, of the Westinghouse company, and E. B. Thomas, of the Erie Railroad, as a fifth member, who, in case of an even disagreement on the part of the four gentlemen first named, is to have the deciding voice. The commission, we are credibly informed, has been meeting on an average once a week since it came into existence, and in not a single case have the services of the fifth member been required. So far as the ELECTRICAL REVIEW is informed, no other companies have entered into this agreement, although in two or three instances the matter was considered for some time.

We publish some interesting election congratulations on another page. It is evidently the belief of the authors that there is to be a pronounced revival of business. A good point in regard to the cutting of prices below any possible profit is made by one correspondent. The ELECTRICAL REVIEW is convinced that the electrical industry will be benefited to a large extent by the general improvement; and, while no particular boom is expected or desired, there will be a greatly increased demand for the product of the manufactories of electrical and allied interests.

Nothing but praise has been heard for the appearance presented by the electrical brigade in the sound-money parade in New York city on October 31. Nearly 2,000 men prepared themselves to march in less than a week's time. There are very few things electrical men can not do, and do well, when they get stirred up.

THE FINANCIAL SIDE.

The statements in this column one and two weeks ago, that orders, large in the aggregate, had been placed in almost every branch of the industry, conditioned upon Mr. McKinley's election, has been amply verified by the sequel. Since Wednesday morning the daily press has teemed with reports of a resumption of work by factories, or an increase in time, as the case may be. Developments of this nature up to date include over 100 industrial establishments and embrace over 150,000 men. This is surely a tribute to McKinleyism and sound money. The attitude taken by the President-elect, viz., that his victory was in part due to the support of sound-money Democratic forces, will, it is believed, prevent any radical changes in the tariff. This is also to the liking of business, and has helped along the growth of confidence. In every quarter signs pointing in this general direction of prosperity are manifest. Money has dropped from 100 per cent per annum on call loans, and 12 per cent on time, to 4 and 5 per cent on time. Funds are coming out of hoarding places by the millions, and the United States Treasury has actually refused to exchange paper currency for gold, owing to a lack of the former. Next to agricultural returns, the prosperity of trade is the most potent in upholding values. The country has harvested a bountiful 1896 crop. Its debts are all paid; merchants have never been in a more solid position; their stocks are small, and credits restricted. Moreover, the supplies of material in first, second and third hands have never been smaller. The country has just reached this basis: The staples of life in existence are not sufficient to meet requirements. These requirements are pressing and various interests have sufficient confidence in the future to fill them. Moreover, they are anxious to close transactions speedily, owing to the current low prices. There can be only one outcome. It means a big expansion of business with attendant higher prices, full employment and complete confidence. It is a guarantee against further contraction and distrust expressed in curtailed credits, high money rates, gold premiums and gold hoardings.

In Wall street, where everything is discounted long before it develops, values have had a climb this week. On Wednesday morning efforts to secure securities, both in London and America, were perfectly frantic, and in most cases prices then recorded were higher than those which have since been obtained. The reaction was regarded as healthy and conducive to ultimate stability. Prices closed with a flourish on Saturday in heavy gains throughout the list. In Sugar, the appreciation amounted to 7 per cent; in Tobacco, 4; in Jersey Central, 4; Burlington, 8; St. Paul, 6; Rock Island, 9; General Electric, 6; Louisville & Nashville, 5; Western Union, 3, and so on through the list. The reaction enabled those who failed to get aboard before Tuesday to secure a position, and has united all the aggressive forces on the bull side of values. It is claimed that the present average does not more than offset present trade conditions, and that a very much higher range will be warranted should the expected, in the form of business developments, come to pass.

Foreign capitalists have applauded the verdict of the American people in favor of common honesty, but as yet have shown no particular disposition to make an investment in things American. They have doubtless decided to wait until the complexion of the United States Senate is more clearly determined and the attitude of the new administration towards a comprehensive currency reform bill outlined.

I have talked with quite a number of very well informed and prominent electrical men this week, and have met the almost universal opinion that the industry is destined to have a big boom. The basis of these conclusions is to be found in the history of the business during the past two or three years. Manufacturers did not recognize the adverse business conditions when the 1893 storm broke. As a consequence, they continued heavy production well into 1894. This was followed by a reaction in prices, all the heavier because of the delay. All negotiations for new apparatus were declared off, and, despite the exceedingly low prices which ruled, the only demand of any importance was for supplies rather than for new apparatus. The necessities of the users of apparatus have been growing more acute for 18 months. In addition to this, a demand for new apparatus has accumulated. During the darkest days of the trade history in this year, the patent pool stepped in and checked a further decline in prices. The operations of this organization have been sufficient since June to steady prices, and, in fact, is named as the cause of the 5 per cent advance that has recently occurred.

At any rate, an enormous demand for electrical apparatus is about to develop. Low prices and a concentration of business will act as a guarantee against any radical cuts.

There is every indication that a market is to be furnished for the financeering of street railway and other issues. As is well known by every promoter of an enterprise of this kind, this is a very desirable and, in fact, necessary preliminary. A market for street railway bonds at anything near intrinsic values will certainly lead to very important developments in this field.

The big manufacturing electrical companies are certain to profit directly through any improvement that may develop along these lines. They take a very roseate view of the future, and well they may. It is possible, if not probable, that changed industrial conditions may lead to a resumption of negotiations with some of the manufacturing companies with a view of bringing them into the Westinghouse and General Electric pool. The climb of General Electric stock of some six points to 34⅞ brings it within about five per cent of the highest figures of last Spring, reached in discount of the patent pool. In the decline which carried it low in the 20's, it was steadily accumulated, and is now believed to be more completely concentrated than ever before.

Western Union Telegraph advanced from a low last Saturday of 84¾ to a high to-day of 87⅞. All of the inactive stocks showed moderate advances and were firmly held. Among them were Edison Illuminating at par, Erie Telegraph at 64½ and American Telegraph and Cable at 93½.

In Boston, Bell Telephone advanced some 7 points to 210, closing at about that figure. Erie Telephone's gain was 2½ to 63½. General Electric preferred advanced 6 points to 70, despite the certainty that there will be no action taken on the accumulated dividends for a long time to come. New England Telephone gained 5 points, touching 98. Electric Storage Battery stocks advanced moderately, closing at 28¾ and 31 for the common and preferred, respectively. Westinghouse common was quoted at 26 and held at 27, and the preferred at 49½ and offered at 50.

About $100,000 of various electrical bonds were sold during October. Of this amount, $23,000 General Electric bonds, debenture 5's, were included. The price ranged between 88 and 91. Prices, as a rule, showed some improvement.

BAIN.

New York, November 7.

PERSONAL.

The Ansonia Brass and Copper Company, of New York city, has secured the services of Mr. Frank X. Cicott to represent their electrical and metal departments.

Mr. W. A. Bisland has been elected vice-president of the Western Telephone Construction Company, of Chicago, in place of Mr. Geo. F. Stitch, who has retired from the service of the company.

Mr. J. J. de Kinder, a widely known consulting engineer of Philadelphia, was a New York visitor last week, the guest of Mr. H. T. De Puy, of the Babcock and Wilcox company, at the Lotus Club. Mr. de Kinder was for a number of years in the navy of Holland and is now on the engineering staff of the Pennsylvania Railroad, H. R. Worthington & Company, and numerous other leading companies of this country.

Mr. J. G. Ruhl, secretary and treasurer of the Mitchell Tempered Copper Company, Corry, Pa., is an old-time railroad man of a very wide acquaintance. His company is well backed financially, and intends giving to the trade the purest and best of copper castings. Captain Dan Mitchell, formerly of the Mitchell-Brandt company, Erie, Pa., is superintendent of Mr. Ruhl's company.

The Berliner Case.

Arguments in the Berliner case were begun before the full bench of the United States Supreme Court at Washington, D. C., on Monday, November 9. Messrs. Joseph H. Choate and F. P. Fish appeared for the American Bell Telephone Company, and Judge R. S. Taylor, of Ft. Wayne, Ind., and Mr. Causten Browne appeared for the government.

Erie Telegraph and Telephone Company.

This company has declared a regular quarterly dividend of one per cent, payable November 16 to stockholders of record November 7. The comparative subscribers' statement is as follows:

	June 30, 1896.	Sept. 30, 1896.
Exchange	18,666	19,420
Agency	1,290	1,294
Total	19,956	20,714

Net gain, 758.

The Lake Street Elevated Road at Chicago, Ill., has been in operation with electric motors for about one month. It was estimated that these motors would save in cost of operation about $10,000 a month. The saving thus far has been something over $4,000 a month in labor alone. The saving in other directions has not been very carefully computed, but it has not been equal to expectation because of various drawbacks and mishaps naturally attending such a change. The cost of equipping the line with electricity has been $294,000.

THE GREAT BUSINESS REVIVAL.

CONCERNS ALLIED WITH THE ELECTRICAL FIELD AFFECTED BY THE PRESIDENTIAL ELECTION.

Beginning the middle of last week, as soon as it was definitely settled that Major McKinley had been elected to the presidency, a revival among the manufacturing industries of the country at once set in. The railroad shops, iron foundries and cotton mills took on thousands of employés and began running full time. Among the concerns allied with the electrical industry which have felt this revival in trade are the following:

The Addyston Pipe and Steel Company, Cincinnati, will start two idle mills as soon as repairs now in progress are finished.

The Stilwell-Bierce & Smith-Vaile Company, of Dayton, Ohio, have given out a large order for printing in preparation for a largely increased trade.

The Barney & Smith Car Works, Dayton, Ohio, have begun operating their plant with 2,000 men.

Several of the car manufacturing companies in St. Louis have made large additions to their working forces.

The machine tool manufacturers throughout New England have added to their list of employés, and most of the firms are running full time.

The Ball & Wood Company, of New York city, manufacturers of steam engines, have had a very good business year and have been operating their plant on full time. Secretary Vincent states that his company will soon add a night force in its shops. During Friday and Saturday of last week the Ball & Wood Company had more business inquiries than during the previous two months.

Mr. Charles Blizard, New York manager for the Electric Storage Battery Company, states that in the first four days of November he did more business than in the previous two months, which were good average months.

The Safety Insulated Wire and Cable Company, of New York city, has been running full time during the past year and will soon have to add a night force. General Manager Requa reports that he received last week a $75,000 order that had been hanging fire contingent on Major McKinley's election.

It is reported that Mr. Thomas A. Edison will open his magnetic ore separating plant at Edison, N. J., with a large force of men. Mr. Edison is confident that this process is now in a commercial form.

Comptroller Fitch, having certified that the Third Avenue Railroad Company, of New York city, has not paid the $250,000 due the city, under the franchise to extend its lines and build a double trolley road up Broadway, from 162d street to Spuyten Duyvil, a permit for opening Kingsbridge Road has been refused by the Department of Public Works.

THE MODERN POWER HOUSE.

READ BEFORE THE AMERICAN STREET RAILWAY ASSOCIATION, ST. LOUIS, MO., OCTOBER 20, 1896, BY RICHARD M'CULLOCH, COMMITTEE.

In beginning a paper of this kind, it is usually considered proper to start with a sort of historical review, but in this case we are immediately struck with the fact that, unlike most modern institutions, the eventful history of the street railway power house has been condensed into the last few years. The conditions, the general design and the greater part of the machinery itself have been evolved during the last 10 years. All of these have changed rapidly, and the manager who now deplores as antiquated a power house built six years ago, with the best existing machinery and in the light of the most approved practice, can say with Cicero, that it was not his fault, but the fault of the times.

It may be readily seen that there are two standpoints from which the design of the power house may be viewed. That of the one who strives that the general plan, that each machine and that every arrangement shall tend solely towards the cheapest possible production of power; and that of the other who, while appreciating the position of the former, desires also that nothing shall enter into the design which will materially affect either the simplicity or the reliability of the plant. The cost of power on a large road is about 10 per cent of the total operating expenses, and it is almost a self-evident fact that the use of any apparatus which might produce unreliable service, and thus impair the receipts and ruin the prestige of the road in order to save a small percentage of this cost of power, would be very bad business policy. The first criterion of any machine installed in a power house should be absolute reliability, and the second, economy.

A great deal has lately been written concerning the proper location of power houses and formulas, and graphical methods for determining this point have been derived, but we doubt very much whether any street railway power house has ever been located, either by graphics or by the differential calculus. Unfortunately, it usually happens, especially in cities, that the electrical center of the distribution system falls in very valuable ground, entirely unsuited for a power house location, and the final location is very often influenced by the extremely unscientific fact that the railroad company owns that particular piece of ground and can not find a purchaser for it. In selecting a location, it is very important that a large power house should be placed on a railroad track, so that coal may be readily and cheaply delivered, and it is very desirable that the location should be on some water supply, in order that condensing engines may be used, unless the conditions will warrant the use of self-cooling condensers. If a location fulfilling these conditions can be found somewhere near the electrical center of distribution, it is an ideal spot for a power house, but if, in order to secure coal and water, it must be moved from this point, it should, if possible, be moved in the direction of future extensions of the street railroads. There are cases where power houses can not be located on the steam railroad tracks, but the only excuse for such a location is where the interest on the cost of copper feeders running from the steam railroad tracks to the center of distribution would greatly exceed the cost of hauling of coal in wagons.

The main points which should be borne in mind in the design of the building are that it should be light, airy, compact and fireproof. The shape and size of the building will be largely governed by local conditions, but there is one general arrangement which has been adopted in a number of the most recent power houses. This will be discussed later. There is no reason why anything combustible should enter into the construction of a power house. The walls may be brick, the roof of slate, tile or iron, and the floors of concrete or iron. This method of construction not only increases security against fire, but it obviates the necessity of carrying insurance, the saving of which will in a few years pay the extra first cost. The building should be substantially constructed, but unless the location is on an important street there is no necessity of going to great expense to render the building ornamental, especially as all money which can be spared for this purpose may be far better invested in machinery to put inside the building. In erecting a building for use as a power house, it is advisable to decide first on the style, size and arrangement of the machinery, so that no part of the building will interfere with the proper repairs, renewals and inspection of the apparatus. This may seem unnecessary advice, but it is a very common oversight for railroad companies first to decide on the style of building they wish, then let the contract for the erection of the power building, and then find themselves hampered in the use of some particularly desirable form of apparatus by the shape or contracted area of their buildings.

As by far the greater number of the modern railway power stations are operated by steam power, steam alone will be considered in this article. For convenience in discussion, the apparatus in a power station may be divided in three classes. 1. The steam generating part, consisting of the boilers, pipes and all their accessories, such as coal and ash conveyers, mechanical stokers, stacks, economizers, feed-water heaters, pumps, etc. 2. The steam consuming part, consisting of the engines, steam separators, oiling devices, condensers, etc. 3. The electric part, consisting of the dynamo, cables, switchboard, electrical instruments, etc. The division between the first and second parts is more easy and more marked, as it is usually accentuated in the power house itself by means of a brick wall.

Beginning with what we have called the first part, we start with the choice of fuel. This is largely a matter of location. In a general way the proper fuel to use is that which will evaporate the greatest quantity of water per dollar's worth of fuel. It does not pay to burn too poor a quality of fuel, however, because slack containing a great quantity of ash and sulphur will cake and clinker on the grate bars, make a great deal of work for the firemen, refuse to be forced when necessary, and make much ash to be removed. On the other hand, it will not do to make all arrangements for using a very expensive fuel, as a very little wasted in times when the furnaces must be rushed will make a great difference in the cost of operation. As an expensive fuel usually means one which is brought from a great distance, any furnace prepared for burning this would operate under unfavorable conditions if the supply is cut short by strikes or railroad blockades. Where the conditions are favorable for the use of oil, it makes an ideal fuel, requiring no handling, making no smoke or ashes, and allowing the fire to be regulated with the utmost nicety. Buckwheat anthracite coal is used largely by power houses in the eastern cities. It is of high calorific value, clean, making no smoke and little ash, and capable of being readily handled in coal conveyers and mechanical stokers. In the western cities, soft bituminous coal is used by force of necessity. This brings with it the troubles of ash, clinker and dirt, and, in the city, renders necessary some form of smoke consumer. As has been stated, it usually happens that the choice of fuel is a matter of location, but in cities, where several competing grades of coal come to market, it would probably pay to have expert tests made to determine what grade of coal or what mixture is most economical for the work.

It is hardly within the limited scope of this article to discuss the numerous forms of coal and ash conveyers which have been put in use. Several large companies make a specialty of this form of machinery, and special designs are developed for each power house. We may say, in a general way, that, in power houses handling large quantities of coal, where the coal is all delivered at the same place, as by rail or boat, the installation of coal and ash handling machinery will pay. Where coal is delivered in small quantities, and where it is delivered in wagons and may be dumped at any part of the boiler room, the reverse may be said. The advantage of this form of apparatus is its saving in labor, and its disadvantages are its great first cost, its expensive maintenance, and the fact that it is desirable for the best service that the coal should be fairly uniform in size, which is a requirement not always easily fulfilled.

In the East the use of mechanical stokers has grown to such an extent that no large power house is considered complete without them. In most of the western cities however, and especially here in St. Louis, the mechanical stoker has not been a success. This difference in results may be attributed to the difference in the fuels used. The buckwheat coal of Brooklyn and Philadelphia feeds evenly on the stoker and causes no trouble by cementing the grate bars together by clinkers. With the soft, fragile, bituminous coal, however, clinkers soon form on grate bars, and very often the fire must be almost completely destroyed to remove them. No mechanical stoker will bear crowding to any great extent, and any power house using them must be supplied with a greater capacity of boilers than one where hand firing is the practice. By reason of the fact that the coal is introduced gradually into the hotter part of the fire and the volatile matter slowly driven off, the mechanical stoker is a partial smoke consumer. With the exception of this, there is no advantage in the use of mechanical stokers, except the labor saved, as the great efficiency which was formerly claimed for them has never been proved in actual practice.

Notwithstanding the great number of types of boilers on the market, they may be divided into two general classes—fire-tube and water-tube. In most of the more recent power houses, some form of water-tube boiler has been adopted, as this type possesses some marked advantages over the fire-tube. They are non-explosive; they can be operated at a higher pressure, and, consequently, are more suitable for use with compound engines; they have a large heating surface and are quick to respond to calls for power; they occupy less floor space and are usually more intelligently designed than the other class. On the other hand, their first cost is greater; there is a greater number of joints to be looked after, and the cleaning is more difficult, especially in those forms which use a curved tube. It has usually been considered that the efficiency of water-tube boilers was much higher than the fire-tube, but there is now a form of fire-tube boiler being made consisting of a shell of large diameter and extra length, containing a large number of flues, which approaches the water-tube very closely in efficiency. The high efficiencies obtained in boiler tests are seldom reached in actual practice, as they usually result, not so much from excellence of design in the boiler itself as from careful and intelligent firing during the test.

It is hardly necessary, in presenting a paper before this intelligent body, to discuss the reasons why water should be fed into the boilers as hot as possible. Besides preventing the straining of the boiler shell from the sudden changes in temperature, there is a large quantity of fuel saved, and the percentage of this saving will be found tabulated in nearly every work on thermo dynamics. The usual methods employed in heating the feed-water are, first, by the heat of the exhaust steam, and, second, by the heat of the escaping flue gases. There are numerous patented devices for utilizing the heat of exhaust steam, either by passing the exhaust through a number of pipes surrounded by the feed-water, or by spraying the feed-water across an opening through which the exhaust steam is admitted. Most of these devices are very simple in their construction, and their efficiency depends very largely on the length of time the feed-water and the exhaust steam are in contact, and in case they are in separate chambers, upon the conductivity of the separating medium. Care should be taken that the opening for the exhaust steam is never contracted, so that any possible back pressure on the engine is avoided.

The method of heating feed-water by the heat of the escaping flue gases has been applied in apparatus under the general name of economizers. The arrangement usually employed is a coil of pipe containing the feed-water placed in the flue. In order to keep the soot from settling on the pipes, most forms of economizers are supplied with a mechanism for scraping off the pipes whenever necessary. Sometimes the economizer consists of one large bank of pipes placed in the main flue, and sometimes the apparatus is divided into a number of banks placed in a flue leading to one furnace. The choice of arrangements depends largely upon the size of the plant and the general location of the boilers. By means of a properly designed economizer, feed-water may be heated to a very high temperature, even above the atmospheric boiling point of water. In the use of any device in which feed-water is heated by the flue gases, care should be taken that the escaping gases will still retain sufficient heat for the maintenance of the necessary draft after part of their heat is taken from them by the feed-water. In the case of power houses using natural draft, economizers should not be used where the draft is not already sufficiently strong, or is just barely strong enough for the work to be done. There are in operation, however, many plants using natural draft, discharging flue gases at a very high temperature, much higher than is necessary to maintain the required draft. Economizers used in such cases would result in a marked gain in economy.

Whatever system of heating feed-water is used, the apparatus should be made abundantly large for the work to be done; first, that the water should pass through slowly and receive the full benefit of its contact with the heated gas or steam; second, that a large store of water may be kept on hand, which is of great service in case of a sudden demand on the boilers; and third, that the feed-water heating apparatus may act as a water purifier. It has been found that water kept for some time at a high temperature will deposit a great portion of the carbonates and sulphates of lime and magnesia, which it has in solution. This is probably due to the expulsion by the heat of the carbonic acid gas contained in the water, thus freeing from solution the lime and magnesia which, it is well known, are slightly soluble in water containing carbonic acid gas.

With condensing plants, the waste from the condensers is never at a greater temperature than 100 degrees Fahrenheit, and if hot feed-water is desired, the use of an economizer becomes almost a matter of necessity, as the water from the pumps and the other non-condensing machinery would not have sufficient effect in heating the feed-water of a large plant.

Several of the large p.. er houses built during the last few years have abandoned the use of stacks for producing draught, and are operating by means of an induced draft produced by fans placed in the flue or short stack. In this case the stack is just high enough to clear the roof. This system has many advantages. First, there are no stacks to blow down or fall down, and this point is of special importance in a region subject to tornadoes. The second and most important advantage, however, is the absolute control which it affords in governing the fires, and this point will appeal especially to those power houses subject to sudden and rapidly changing loads. As an illustration of this may be cited the power house recently erected to operate the Belt Line tunnel road, in Baltimore, Md. A great part of the time there is no load on the power house, as it is only operated when there is a freight train to be hauled through the tunnel. The manner in which the load is handled is as follows: The boiler room is supplied with blowers in place of stacks, and a slow fire is kept constantly under each boiler. When a telegram is received that a freight train is approaching, the blower is started, and, on the arrival of the train, steam has been raised in sufficient quantity to supply the great demand put upon the boilers. This illustrates the extreme flexibility of the system, and it would be difficult to handle this load in any other manner. Economizers are operated with great efficiency in connection with an induced draft, as this system permits the flue gases to be robbed almost entirely of their heat, since it is not necessary to have a large quantity of heat in the flue gases in order to create a proper draft.

Passing from the steam generating system to the engines, we find as a connecting link the system of piping. In regard to the general plan of the piping, opinion is very much divided. Some favor a single header with leaders to the engines. Others claim that a complete duplicate system is necessary, so that a failure in any part of the system need not cause a serious stoppage. The objection to a duplicate system is the greatly increased cost. In the installation of a duplicate system, it is only human that the material and workmanship employed will be cheaper than if a single system were employed, because it is reasoned that if one side breaks down, there is always the other to be depended upon. The other side, however, is often never used until a case of necessity arises, and on account of this very lack of use, the valves and joints are apt to be found leaky and in bad condition when suddenly put in operation. A compromise system has been used in some cases in which all pipes are duplicated, each side, however, having one-half the capacity required, necessitating the use of both sides at all times. In case of accident to one side, the other half of the system may be used, at a disadvantage, of course, by increasing the steam pressure. The best plan, however, seems to be to use a single header divided at convenient intervals by valves, according to the size of the plant and the number of units employed, and in laying out the system to use only the best valves, material and workmanship. The power houses having the least amount of trouble with their piping are those having a simple system, probably because it is natural to erect better, and take better care of something which is in constant use, than something which may easily be dispensed with. All steam and hot-water pipes should be covered so as to prevent as much as possible loss of heat by radiation and consequent condensation of the steam. And in this connection it should be noted that there is a great difference in efficiency in the different kinds of pipe covering. Tests have shown that the magnesia plastic and sectional coverings and the asbestos fire felt covering give the best results.* A water separator should be placed in the leader to each engine. It should be large in size and placed as close as possible to the engine. A number of patented separators are on the market, but very good results may be obtained by the use of a simple, large tank with the steam entering at the side and leaving at the top and supplied at the bottom with a connection to a steam trap to catch any water collecting in the separator.

The question of the selection of the proper engine to operate the plant is so dependent upon what dynamo is to be used that it will be best to abandon our arbitrary classification temporarily and take up first the question of the dynamo. During the past four years the street railway generator has undergone a radical change. In the Spring of 1893 there were installed in this city, in the power house of the Cass Avenue & Fair Grounds Railway Company, then being built, the first large direct-driven generators of this type, which have since become so common. Soon after this the Intramural power house at the World's Fair was put in operation, containing one generator of the same size as those in St. Louis and another of twice the capacity. Since that time there have been few large power houses built in which direct-driven generators have not been installed, and some of the large railway systems have found that economy of operation required a change from the belt, counter-shaft and unit of small size to the large, direct-driven generator. At the present time, the West End Railway Company, of Boston, which may be considered the pioneer in this country in electric traction, is changing its central power station, which had originally been equipped with a very complete and elaborate system of belting and counter-shafting to a direct-coupled plan.

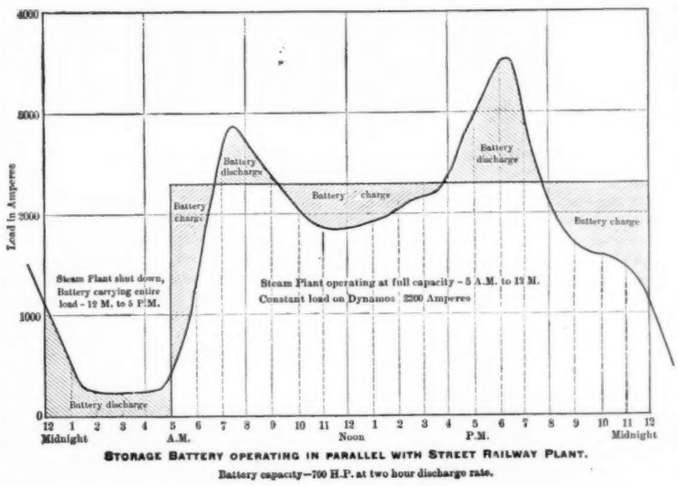
The first cost of the direct-coupled generator is about 35 per cent more than the belted generator in the 500-kilowatt size, which is the largest standard size in which the belted generator is made; but when the expense of the belt, belt-tightening device and the floor space is taken into account, the direct-connected generator will be found the cheaper. Besides obviating the necessity of the costly and cumbersome belt, the direct connected generator offers the following advantages: In large sizes and in connection with large engines it has a much higher efficiency than the belted unit, it requires a small floor space, it aids supervision by bringing the working parts of the engine and generator close together, it reduces danger, it is almost noiseless in operation, and it may be installed in a larger unit than the belt-driven generator, which is limited in size by the width of the belt and pulley which may be employed. The main objection which was urged against the direct-connected generator was the fact that the shocks resulting from overloads were thrown directly on the engine, and that there was none of the cushioning effect that a belt connection might supply. While this is undoubtedly true, the best argument which may be submitted against it is that none of the installations of direct-driven generators can trace any trouble to this source. The large, slow-speed, multipolar, direct-driven generator has become, perhaps, the most prominent feature of the modern power house, and while there may be special services which would necessitate a belted arrangement, it is difficult to imagine a power house thoroughly up to date without direct-driven generators.

By varying the number of poles and the number of armature conductors in the construction of a dynamo, the machine may be designed to run at almost any reasonable speed, the slower the speed, however, the greater being the cost of the dynamo. In the matter of speed it is necessary for the dynamo maker and the engine builder to effect some sort of a compromise, because it is not good practice to run such large engines at too high a speed. The speeds which are most common are 75 revolutions per minute for the 1,500-kilowatt dynamo, 80 to 120 revolutions per minute for the 800-kilowatt dynamo and speeds running from this to 150 revolutions per minute for the smaller sizes. These speeds are what would have been considered, four years ago, quite out of the range of the Corliss valve gear, but the makers of this type of engine have risen to the occasion and now there are numbers of large Corliss engines driving generators at speeds up to 100 revolutions per minute, and some have even higher speeds than this. Several other types of engines have been adapted to this work and are running quite successfully. Outside of the question of valve gear, most engines made for this work possess the same characteristics; the heavy bedplate, the solidly constructed flywheel, now being made of steel plate, the wide cross head, the large connecting rod and the mammoth main bearings.

The choice between horizontal and upright engines is chiefly one of space. The horizontal engine is the cheaper, the simpler, the easier to inspect and the easier to repair. Outside of the advantage of requiring less space, the upright engine has the advantage of less wear on the cylinder, and a more direct strain upon the foundations.

The usual practice in the most modern power houses is to install compound engines. Most of these plants are so favorably situated that condensers may be operated in connection with the engines. This is undoubtedly good practice, but, in case condensers are not used, the cost of fuel must be very high for the gain in compounding to pay for the extra investment. Where power houses are favorably situated on bodies of water, condensing becomes a very simple problem, but in case the power house can not be built on a body of water, as in this city, for instance, in order to use condensing engines, some sort of arrangement must be designed to cool a quantity of water so that it may be used over and over again for the purpose of condensing the exhaust steam. Devices of this kind have long been in use in the city of San Francisco and in Cuba, and lately several of the large manufacturing companies have put on the market complete apparatus for the purpose of cooling water after it has condensed the exhaust steam so that it may be used again for the same purpose. Besides the gain in power by using condensing engines, it is claimed that by the use of this apparatus, actually less water is used than if the steam is exhausted directly into the atmosphere without condensing.

In the use of large direct-connected units a great deal of the economy to be gained depends upon the selecting of the proper sizes of units. The efficiency of a generator will be good when it is operated at more than 75 per cent of its capacity, but the efficiency of an engine drops off very rapidly when it is running below its rated load. In order to achieve the best economy from the use of large direct-connected units, the sizes of the different generators should be so


4000
3000
2000
1000
0
Load in Amperes
Battery discharge
Battery charge
Battery discharge
Battery charge
Battery discharge
Steam Plant shut down, Battery carrying entire load - 12 M. to 5 P.M.
Steam Plant operating at full capacity - 5 A.M. to 12 M.
Constant load on Dynamos 2200 Amperes
Battery charge
12 Midnight 1 2 3 4 5 A.M. 6 7 8 9 10 11 12 Noon 1 2 3 4 5 P.M. 6 7 8 9 10 11 12 Midnight

STORAGE BATTERY OPERATING IN PARALLEL WITH STREET RAILWAY PLANT.
Battery capacity—700 H.P. at two hour discharge rate.

FIG. 1.—LOAD DIAGRAM OF MODERN ELECTRIC RAILWAY POWER HOUSE.

*Journal of the Association of Engineering Societies, January, 1895.

proportioned that it is always possible to operate one or more units at their rated capacity. The railway generator as at present built will stand an overload of 50 per cent for several hours without trouble and at a maximum efficiency. This should be taken into account in the estimate of the dynamos required, but it should always be the aim to have at least one idle machine to throw on the line in case of failure of any of the others. The actual size of the units depends upon the character of travel which the road possesses and the number of cars, and this must be determined for each road independently. In choosing machines, however, standard sizes should always be adopted as this obviates any trouble in obtaining supplies and repair parts.

The railway generator switchboard has become standardized to the extent that it consists of a panel for each generator, each panel containing the usual automatic circuit-breaker, ammeter, field rheostat, field switch and main switch. It is hardly necessary to mention that there should be nothing combustible about the board, and it is not an absolute necessity for the board to contain a marble tablet inscribed with the illustrious names of the president, vice-president and secretary. It would confer equal fame, and perhaps be more economical of valuable space, for their names to be handed down to posterity in some manner less electric. Switchboards as now erected usually contain a recording wattmeter and an ammeter, which show the total output of the power house. The recording wattmeter especially is a valuable instrument, as by means of its readings exact records of the power house may be kept.

The modern method of line construction is to divide the trolley into sections and connect each section separately to the main bus bars through feeder panels, each of which contains an automatic circuit breaker, an ammeter and a switch. This method confers the advantages that trouble on the line is always indicated on the proper section, and that in case of short circuits on the line, the main circuit breakers are protected by the section circuit breakers and the load is not suddenly thrown off the engines by the opening of the main circuit breakers. Most of the generator and feeder boards are supplied with devices for preventing damage to the station machinery by lightning, but a very simple and effective arrangement is to connect a large water rheostat between the positive bus bar and a good ground. This is either left in circuit continuously with a small current running through it, or is cut into circuit on the approach of a storm.

Besides those machines which are absolute necessities in a power house, there are various devices which may be added to secure convenience and regulation. An overhead crane is installed in the engine room of most of the large modern power houses and adds greatly to the speed with which heavy repairs may be executed. An oiling system of some sort by which the oil is either pumped or flows by gravity to the different bearings obviates the necessity of manual labor in oiling and insures a steady feed at each bearing. A recording steam gauge is found very useful in checking up the firemen. An air-pressure system is beginning to be used in many of the power houses, by means of which the carbon dust may be blown out of the armature windings.

With this apparatus an armature may be kept thoroughly clean, and the danger lessened of short circuits occurring on account of the collection of carbon dust between its conductors.

If readings be taken of the total output of the power house at stated intervals and then plotted, a load curve will be obtained similar to that shown in Fig. 1. A study of this will show a very small load through the night from 1.30 A. M. to 5.30 A. M., a sudden rise at this point to a maximum about 7.00 A. M., a lower load through the middle of the day, followed by another peak between 6.00 P. M. and 7 P. M., after which the load again suddenly drops. In order to accommodate the machinery to the varying load, the number of dynamos in circuit must constantly be changed, and even then it is almost impossible to suit the power at all times to the load, the dynamos running much of the time either overloaded or underloaded, which, of course, means a sacrifice of economy. In addition to the variation of load shown by the curve, there is a momentary fluctuation, due to the starting and stopping of cars, the violence of which decreases with the number of cars in service. It is proposed to remedy this variation and operate the dynamos under a steady load by means of a storage battery plant, connected in parallel with the line, charged from the dynamos during the period of light load and discharged into the line on the heavy call for power. The operation of the plant under these conditions is indicated in Fig. 1. Installations of this sort have been placed in several of the large electric light plants, where they are operating with marked success, and there is no reason why they should not meet with the same degree of success in electric railway plants. By means of this auxiliary plant, the proper number of dynamos are run throughout the entire day at their full capacity and hence at their highest efficiency, the battery taking care of all eccentricities in the load, charging when the load is less than the capacity of the dynamos, and discharging when the load exceeds this. The steam plant may be shut down entirely during part of the night, leaving the battery to operate the road, and in case of a breakdown, the battery may be used to take care of the entire load for a short time. The battery is discharged through a booster dynamo, which is so designed that the compounding of the dynamos and the battery is the same. This arrangement is entirely automatic, so that no hand regulation is required. The efficiency of a battery operating under conditions of this kind will be guaranteed by the manufacturers to be greater than 75 per cent and a maintenance of 60 per cent on the first cost of the battery will be guaranteed. The great drawback to this system of operation is the large first cost of the battery, which is about $100 per horse-power capacity, figured on a two-hour discharge rate. A storage battery plant may also be used to increase the capacity of an existing power house and thus save the necessity of adding more machinery. There is another use to which a storage battery plant may be put which will, perhaps, appeal more strongly to the street railroad man. This is to install it as a sub station to maintain the voltage at the end of long feeders, which are subject to fluctuating loads. In this case the batteries are charged from the distant power house and discharged into the trolley wire. The feeders from the power house to the storage batteries are figured only for the average load instead of the maximum load, as would be necessary in case the line is fed directly from the power house. The economy in this installation depends very largely upon the difference in cost between the feeders in the two cases. Besides the question of economy, however, the sub station will give the better service, as the voltage will not fall and rise with the fluctuations of the load.

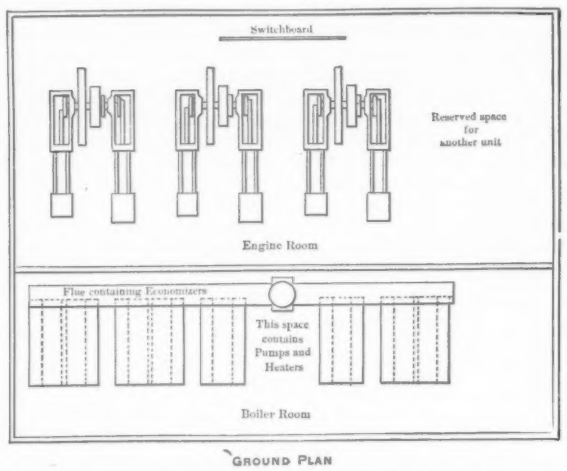


FIG. 2.—GENERAL FEATURES OF THE MODERN ELECTRIC RAILWAY POWER HOUSE.

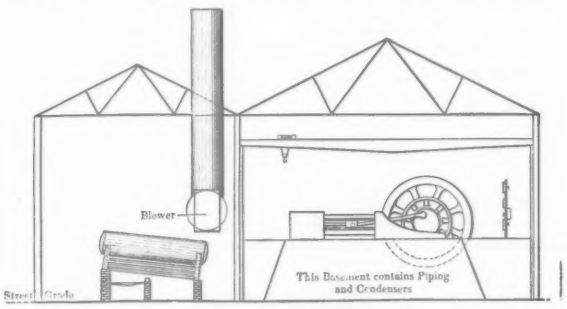


FIG. 3.—GENERAL FEATURES OF THE MODERN ELECTRIC RAILWAY POWER HOUSE.

A number of power houses operating long lines are now equipped either with boosters or high-voltage dynamos. Long lines usually have a booster constantly in circuit. This machine is automatic in its action and raises the voltage with every increase in the load. Some power houses operate a high-voltage dynamo for use on sections which are subject to excessive loads. The feeder boards in this case are equipped with an extra bus bar, so that any section may be thrown on the high-voltage machine.

While each individual engineer has his own ideas concerning power-house construction, and while each road building a power house may purchase different apparatus, there is one general design which has been followed in many of the plants usually installed. It has been adopted by so many different engineers and in so many different places that it might almost be called the modern power house. The general features of this design are shown in Fig. 2. The engine-room and boiler-room are divided by a brick wall and under different roofs; both are brick buildings, covered with an iron truss roof; the boiler-room is set on the grade of the street, and the engine-room 10 or 12 feet above this grade, the space below the engine-room being utilized for the piping and condensers; the engine and boilers are set at right angles to the wall between them, with the engines next to the boiler-room, so that the piping is made as short as possible and the condensation lessened; the switchboard and feeder board are set on the opposite side of the room from the boiler-room, so that the length of the dynamo cables is equalized as much as possible. The general features of this design may be summed up as follows: It is compact to save real estate and buildings and to minimize the number of employés and the superintendence. Large units are used for the sake of economy and to save the number of working parts. The building is as far as possible fireproof.

The electric part of the problem has been solved, temporarily at least, but the adoption of the multipolar, direct coupled dynamo. The large, slow-speed engine has followed as a necessary consequence, and the general direction of improvement in power-house construction seems to be toward the use of devices to prevent the waste of heat and to minimize the labor required.

There can be no more appropriate place to quote the proverb that cleanliness is next to godliness. An engine and dynamo-room should be kept scrupulously clean. This is especially true in regard to the electrical devices, as a very small amount of grease and dirt in the wrong place will cause serious damage. Beyond the mere æsthetic consideration that cleanliness improves the looks of things, there is also the fact that a thorough cleaning amounts to a rigid inspection, and small leaks and defects are often discovered in this way, which might otherwise pass unnoticed until they had become serious matters. It is to be regretted that this advice is not more generally followed, as there is more lost through dirty and greasy electrical devices, badly set valves, leaky steam joints, poor firing and careless supervision than ever will be gained through the use of compound condensing engines.

As a means of comparing different kinds of machinery, figures as to cost of operation have been collected from some of the large modern power houses, and their comparison reinforces what has just been stated, that less depends upon the refinements of the machinery than upon the condition in which the apparatus is kept and upon the supervision to which it is subjected. Among those having the lowest cost of operation was a power house equipped with direct-coupled generators, but oper-

ating single-cylinder, non-condensing engines, burning soft coal and using hand firing, while among those having the highest cost of operation are several power houses supplied with compound condensing engines and burning anthracite coal. The lowest results are about three-quarters of a cent per kilowatt hour, some records running slightly below this, while the results from some of the large stations are as high as one and one-quarter cent per kilowatt hour. These figures include the cost of coal, water, supplies, repairs and all labor, but do not include anything for taxes, insurance, interest or depreciation. The cost of operation depends largely upon the cost of coal and upon the relation of the average load to the total capacity of the power house, the higher this ratio the less being the cost of operation.

The modern electric railway power house, although it has been developed entirely within the past 10 years, represents the thought and the experience of many men. It has been developed carefully, detail by detail, until it is now a work both of reliability and efficiency. No one man and no one company can claim the credit for this achievement, but no class of men hold a stronger claim to recognition than the managers and owners of street railroad properties, who have ever been ready to encourage with their patronage each improvement, who have freely distributed the information gained by their experience, and who, even in the most radical departures, have ever acted with the courage of their convictions.

OBITUARY.

William J. Dale, Jr., one of the Massachusetts State railroad commissioners, died at Springfield, Mass., on November 5.

Hon. W. G. Ellis, president of the Amesbury Electric Light Company, died at his home in Amesbury, Mass., after a long illness, on November 3. As head of the Ellis Car Company, he became one of the best known car builders in the United States.

Ductile Cast-Iron.

The accompanying diagrams show the advance made in iron metallurgy and its adaptability for use in electrical apparatus. The product is ductile cast-iron, and the following extract from an issue of the Journal of the Franklin Institute gives a brief description of its valuable qualities: "The samples shown were of an extraordinary character, suggesting many of the qualities of steel, but at the same time presenting features peculiar to iron. The metal is remarkable for its strength, coupled with its ductility. A test bar cast with the breaking section curved in on both sides, instead of being cut out afterwards, as usual, showed a tensile strength of 63,000 pounds to the square inch. Specimens of casting are shown which have had portions heated and drawn out flat under the hammer, afterward being twisted cold and pounded flat without a sign of fracture. A notable piece of work is a heavy chain of which the links were cast open, then joined and the open spaces welded without the use of flux. Intricate castings have been reproduced regularly without a failure, while a very heavy percentage of losses has been reported when made by other methods of producing very strong castings. It has been shown by extensive experiments that the castings made by this company are well adapted for electrical apparatus, owing to their high conductivity. Another important field has thus been opened." Ductile cast-iron is manufactured by the East Chicago Foundry Company, Chicago.

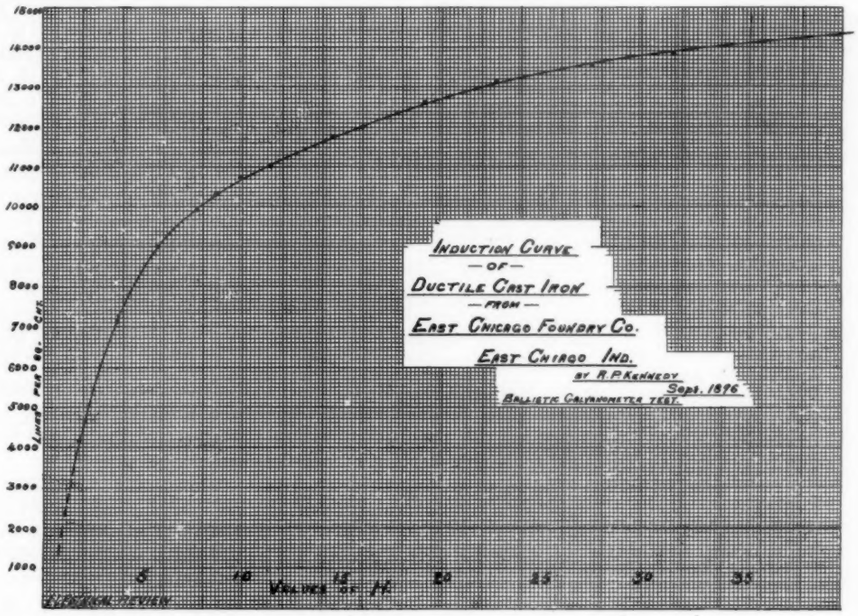


Fig. 1.—Induction Curve of Ductile Cast-Iron.

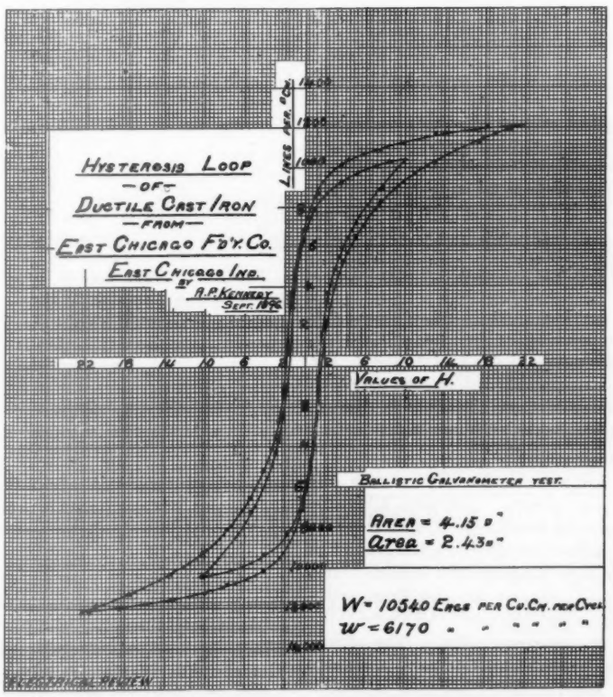


Fig. 2.—Hysteresis Loop of Ductile Cast-Iron.

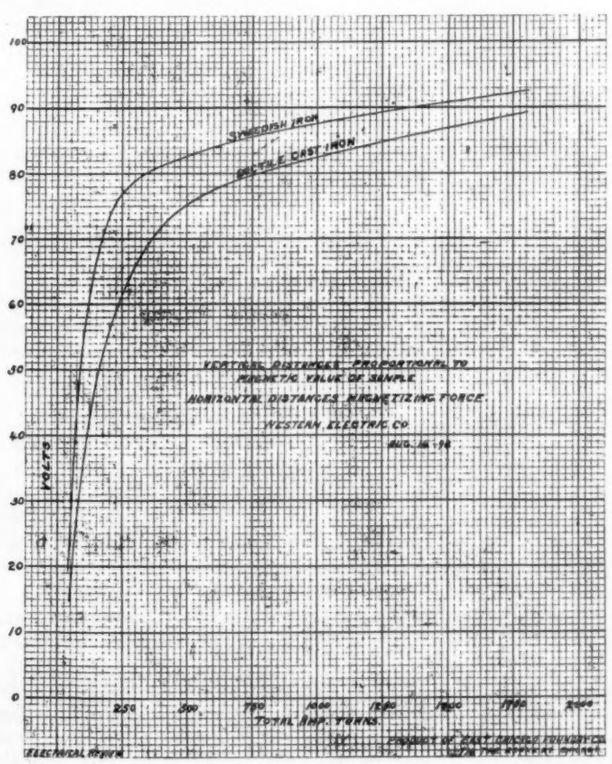


Fig. 3.—Comparative Curves of Swedish Iron and Ductile Cast-Iron.

The American Street Railway Association.

To the Editor of Electrical Review:

The executive committee requests that you will kindly suggest topics upon which you consider it would be desirable to have papers written and presented at the sixteenth annual meeting of the association. We should also be glad to receive any suggestions as to whom should be assigned the duty of preparing such papers.

This matter will be considered by the executive committee at a meeting to be held in the very near future, and I should be very glad to receive your suggestions at an early date.

Yours very truly,

T. C. Penington,
Chicago, Oct. 31. Sec. and Treas.

ADVANCE INFORMATION

Valuable News and Tips for Manufacturers and Dealers.

We publish below information relating to new electric railways, new electric light companies, new telephone companies and projected electric construction of all kinds. Every reader will find these columns of special interest, and manufacturers and supply houses will receive many valuable suggestions looking to new business by carefully watching this department in the ELECTRICAL REVIEW.

Electric Light and Power.

ATTICA, OHIO—City Clerk can give information concerning erection of new electric light plant.

CHATTANOOGA, TENN. — Chattanooga Electric Light Company's new electric light plant is rapidly approaching completion.

SACRAMENTO, CAL —The Gridley Electric Light and Power Company has been incorporated by L. K. Vaughn, R. A. Norman, William Moore, C. H. Brown and C. A. Schorr, of Gridley. Capital stock, $3,000.

WENHAM, MASS.—Steps are being taken to form a company to erect a plant for the purpose of furnishing electric lights to the people of Wenham and Hamilton, and also to the town, if they desire to have them.

ST. LOUIS, MO.—Electric Light, Power and Conduit Company has been incorporated by Samuel M. Dodd, James Campbell and James W. Bell. Capital stock, $50,000.

SUNAPEE, N. H.—Sunapee Electric Light and Power Company has been incorporated, with a capital stock of $4,000.

GARDINER, ME.—City Clerk can give information concerning establishment of new electric light plant.

MARLET, MICH.—This city will erect a new electric light plant. All latest improved electrical machinery will be installed.

CAMDEN, N. J.—New York Lighting Company has been incorporated by John S. Parker, Geo. W. Mark and Clifford W. Perkins, to supply light, power, heat, etc. Capital stock, $10,000.

NEW YORK, N. Y.—The Greater New York Electric Light and Power Company has been incorporated by Jacob Fleischhauer, Allan Lexow, Charles K. Lexow and others. Capital stock, $50,000.

STORM LAKE, IOWA—E. E. Mack is interested in proposed construction of electric light plant, to replace one destroyed by fire, at a loss of $5,000.

WAUKESHA, WIS.—Waukesha Electric Company will erect a modern electric power plant. It will be equipped with all the latest improved electrical machinery.

UNION, S. C.—Bonds for the construction of an electric light plant, to cost about $75,000, have been issued. L. G. Young, clerk, can be addressed.

GRIDLEY, CAL.—The Gridley Electric Light and Power Company has been incorporated; capital stock, $3,000. L. K. Vaughn, R. A. Norman, William Moore, C. H. Brown and C. A. Schorr, of Gridley, directors.

FENNVILLE, MICH.—Ira Hutchins has been granted a 15 year franchise for an electric lighting plant for this place.

LITTLE ROCK, ARK.—Brinkley Electric Light and Power Company has been incorporated. J. J. Ferrell, M. A. Ferrell and F. E. Sapp are the incorporators. Capital stock is $15,000.

WELDON, N. C.—The Roanoke Navigation and Water Power Company has been granted franchise for erection and operation of electric light plant.

FT. WORTH, TEX.—M. R. Rosson, representing Scotland capital, contemplates the purchase of electric light and power plants at Ft. Worth.

GREENWICH, OHIO—An electric light plant and waterworks will be established.

CHATFIELD, MINN.—An electric light plant will be constructed.

TOLEDO, OHIO—A new $2,000 electric light plant will be constructed at the county infirmary.

MARLIN, TEX.—R. G. Wello and Ed Schimming have applied for franchise to erect an $8,000 electric light plant.

FOREST CITY, PA.—The Forest City Electric Light and Power Company has been granted a franchise for constructing a plant and for furnishing the city with 12 arc lights. Work will commence immediately.

ITHACA, N. Y.—The Elmira Electric Company contemplates the establishment of a separate incandescent light plant on East State street.

CINCINNATI, OHIO - The Edison company will erect new electric light plant in this city.

BRIGHTWOOD, IND.—Dr. Johnson, president of the Town Board, may give information concerning the erection of an electric light plant.

New Electric Railways.

CINCINNATI, OHIO—The Cincinnati & Miami Valley Traction Company has been incorporated, with a capital stock of $10,000. The incorporators are Dennis Dwyer, Wm. A. Mays, Albert Emanuel, John T. Wolf and Albert J. Dwyer.

BANGOR, ME.—Work will begin at once on the construction of an electric railway from this place to Winterport. The road will eventually run to Kenduskeag and East Corinth, making a road 40 miles long. The company will lay out a big park somewhere along the river for a Summer resort. A New York syndicate is behind the project.

LOS ANGELES, CAL.—J. W. Hinton has been granted right of way to construct and operate an electric street railway in this city.

GRAND RAPIDS, MICH.—The Valley City Street and Cable Railway Company has been granted permission to construct a street railway.

JUNCTION CITY, KAS.—A new $30,000 electric line will be built from Junction City to Fort Riley.

CHARLESTON, S. C.—The Charleston Street Railway Company has been incorporated by Charles H. Deanes and Edwin S. Jarrett, of New York; James D. Chastain and J. S. Lawrence, of Baltimore, and P. H. Gadsden, of Charleston, to construct an electric railroad. Capital stock, $200,000, which may be increased to $1,000,000.

BOSTON, MASS.—The Wellesley & Boston Street Railway Company has been granted permission to build an electric railway.

ATLANTIC HIGHLANDS, N. J.—The Atlantic Highlands, Red Bank & Long Branch Electric Railway Company is asking for right of way from Eatontown through Oakhurst, Elberon and Deal Beach to Asbury Park.

COHOES, N. Y.—The Albany Railway Company has acquired control of the Cohoes city line, and will extend its freight and passenger traffic to and through the Spindle city.

CLEVELAND, OHIO—E. W. Moore, of this city, has purchased the Lima Electric Street Railway plant, of Lima, Ohio, for $50,250.

WILLOW GROVE, PA.—A trolley line will be put in operation from this place to Trenton. This line will be known as the East Penn Traction Company. Mr. A. S. Cadwallader, of Yardley, is president, and Mr. David Hanley Stone, of Philadelphia, the secretary.

New Telephone and Telegraph Companies.

OGDENSBURG, N. Y.—C. A. Nicholson, of Utica, general manager of the Central New York Telephone Company, has announced that after January 1 the telephone service in this place is to be improved.

MUNCIE, IND.—The Kurtz National Telephone Company has been incorporated, with a capital stock of $100,000.

LOMIRA, WIS.—The Lomira Telephone Company has been incorporated, with a capital stock of $1,000. The incorporators are John Buerger, Henry McCarty, William R. Happe, F. M. Baker, William Schultz, Jr., and B. Jonely.

ARENA, N. Y.—The Arena and Union Grove Telephone Company has been incorporated, with a capital of $2,000, to operate a telegraph line between Margaretville, Arena, Union Grove, Shavertown and Dowersville, Delaware County.

MORRISTOWN, PA. — The Postal Telegraph-Cable Company are about to rebuild their lines from this place to Boyertown, thence to Reading, and also from Boyertown to Easton.

SPARTA, TENN.—A telephone line is to be built, connecting this town with Cookeville, Livingston, Celina, Gainesboro, Carthage and all surrounding towns. It will also connect with Nashville. The line will be built at once.

New Manufacturing Companies.

CHESTER, PA.—Beacon Electric Company has been incorporated, with J. Engle Cochran, Jr., treasurer. Capital stock, $120,000.

TACOMA, WASH.—The British Columbia Electric Company has been incorporated by William L. Thompson, John M. Bell, Charles M. Johnson and Gustave Silbon, to do a telegraph, telephone and mail carrying business. Capital stock, $10,000.

NEW YORK, N. Y.—The Bell Electric Company has been incorporated by Clifford E. Potter, Frank M. Bell and John R. Kein, of New York city, and others, to deal in electric appliances. Capital stock, $150,000.

YOUNGSTOWN, OHIO—The Youngstown Electric Company has been incorporated to manufacture miniature and all kinds of incandescent lamps, chemical and physical apparatus. The officers are: C. C. McNutt, president; Herman Boehm, vice-president; Alois Eichhorn, manager; Emil Schultz, secretary and treasurer.

YONKERS, N. Y.—National Gramophone Company has been incorporated. Capital, $50,000.

Business Troubles.

BOSTON, MASS. — Phineas W. Sprague, of this city, has been appointed temporary receiver of the Blackstone Valley Street Railway Company.

Increase of Capital.

JAMAICA, L. I.—The Jamaica Electric Light Company has filed a certificate of an increase of its capital from $20,000 to $200,000.

LITERARY.

Upon the topic of "High Buildings," A. L. A. Himmelwright contributes much that is valuable to the *North American Review* for November. The difficult problems confronting architects in the designing and construction of these tower-like structures are skillfully presented, and suggestions, useful and original, afford food for careful thought.

The *Home Magazine*, of Binghamton, N. Y., is a beautifully illustrated monthly, resembling in size and general appearance the other leading magazines of the day. At the same time, it has an individuality of its own, and qualities which endear it to a wide and constantly increasing circle of readers. Its aim is to convey interesting information in an interesting manner; to cultivate a love of the good, and the true, and the beautiful; to amuse as well as to enlighten; to represent human life and human energy at its best, and inculcate a spirit of helpfulness and benevolence. Every issue is replete with choice literature for the family circle and timely articles on the great events and movements of the day.

The comparative statement of the Brooklyn Heights Railroad, of Brooklyn, N. Y., for the quarter ended September 30, is as follows:

	1896.	1895.	Increase.
Gross.....	$1,189,871	$1,150,285	$39,586
Net.....	577,691	566,711	10,980
Sur. after charges	71,745	49,985	21,760

Kindred.... ...Interests

The Empire Lamp Works, 154–6 West Twenty-seventh street, New York city, are making a very high-grade line of miniature, decorative, candelabra, multiple and series lamps.

A number of tests have been made by several companies manufacturing arc lamps of the new carbons made by Schiff, Jordan & Company, of Vienna, the results of which have indicated that the recent importations of the Schiff–Jordan company's product show a very decided advance in the results in brilliancy, economy and steadiness of light.

The American Engine Company, of Bound Brook, N. J., have begun the shipment of their new engines, known to the trade as American–Ball engines. The first of these engines, of 100-horse-power capacity, has gone to the Detroit *Evening News*, and the second, a 50-horse-power engine, to the Savannah *News*. Since the addition of this new line of work, the business of the American Engine Company has increased so that they are compelled to run double time, having installed a night force. In the electrical department, among the recent shipments are the following: Cliff Paper Company, Niagara Falls, N. Y., two motors, 150 horse-power each; Detroit *Evening News*, Detroit, Mich., two dynamos, each 25-kilowatt; Albany *Morning Express*, Albany, N. Y., one 18-kilowatt dynamo; Oakland *Tribune*, Oakland, Cal., 25-horse-power motor; A. N. Kellogg Newspaper Company, Chicago, Ill., four 15-horse-power and one 25-horse-power motors; Topeka *Capital*, Topeka, Kas., 5-horse-power motor; Boston *Traveler*, 12-horse-power and 5 horse-power motors; Worcester *Post*, Worcester, Mass., 9-kilowatt dynamo; Cincinnati *Post*, Cincinnati, Ohio, 35-horse-power motor; Philadelphia *News*, 25-horse-power and one 3-horse-power motors; Elmira *Gazette*, 25-horse-power motor; American Newspaper Publishing Company, 25-horse-power motor; Carrington Publishing Company, 12-horse-power motor; J. B. Cranfill, Waco, Tex., 25-horse-power motor; Fall River Publishing Company, Fall River, Mass., one 25-horse-power and 3-horse-power motors; Saginaw *Evening News*, Saginaw, Mich., 12-horse-power motor; B. A. Meade company, Augusta, Me., 3-horse-power motor; Chicago *Journal*, 15-horse-power motor; Grand Rapids *Democrat*, 15-horse-power motor; St. Paul *Pioneer Press*, St. Paul, Minn., 5 horse-power motor; Wallace Publishing Company, Des Moines, Iowa, 12-horse-power motor; New York *Tribune*, two 15-horse-power motors; Rubber Tire Wheel Company, New York, N. Y., 12-horse-power motor.

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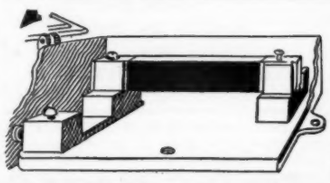

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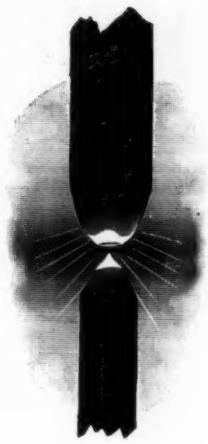

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[Specially reported for this journal by E. S. Duvall, solicitor of patents, Loan and Trust Building, Washington, D. C. Copies of any patent may be secured for 10 cents each.]

ISSUED OCTOBER 27, 1896.

570,140 Section insulator; L. McCarthy, Boston, Mass.—Comprises side bars and end pieces, to which said side bars are attached, the said end pieces having means for securing the ends of section wires, and being provided with deflecting portions which diverge laterally and rearwardly, and also incline rearwardly.

570,166 Insulating joint for metal or armored conduit tubes; E. T. Greefield, New York, N. Y.

570,204 Adjustable telephone transmitter; A. Gartner, Newark, N. J.—The receiver is attached to the lower joint of a toggle.

570,298 Weighing machine; F. H. Richards, Hartford, Ct.—The combination with weighing mechanism embodying a bucket of a feeder, and electric circuit having a motor therein, said motor being operable for actuating said feeder, and a circuit-controller governed by said weighing mechanism.

570,310 Electrical apparatus; J. F. Kelly, Pittsfield, Mass.—In an electrical apparatus having, when in operation, a varying magnetic flux, a laminated iron core traversed by said varying flux having in its composition an alloy preventing hysteresis growth.

570,322 Show case; F. W. Mansfield, Louisville, Ky.

570,328 Electric railway; A. Norman, Toronto, Canada.

570,373 Electrically actuated switch mechanism; W. S. Browne, Brooklyn.

570,410 Electric elevator; F. B. Perkins, Boston, Mass.—A motor, an elevator mechanism actuated thereby, and a starting and stopping mechanism, an electrically controlled locking device for starting and stopping mechanism in circuit with said motor.

570,411 Electric light fixtures; G. A. Schmidt, Brooklyn, N. Y.—A canopy for electric light fixtures, comprising a stationary cup-shaped part of larger diameter than the stem of the fixture, and a shell adjustable longitudinally on said stationary part.

570,416 Circuit-interrupting device; A. J. Wurts, Pittsburgh, Pa.

570,417 Automatic circuit-breaker; A. J. Wurts, Pittsburgh, Pa.

570,418 Switch for electric circuits; A. J. Wurts, Pittsburgh, Pa.—Movable and stationary metal contacts, corresponding carbon contacts in shunt thereto, a lost-motion connection between the movable metal and carbon contacts, a constantly acting retarding means for the movable carbon contact and a single operating handle for the said parts.

570,419 Circuit-breaker; A. J. Wurts, Pittsburgh, Pa.—Main contact terminals, a shunt around the same provided with separable contacts, each of which has a metal portion and an infusible conducting portion so arranged that the current will be the first shunted through the metal and then through the infusible portion.

570,424 Electric motor; S. G. Brinkman, New York, N. Y.

ISSUED NOVEMBER 3, 1896.

570,446 Globe for arc lamps; M. B. Bailey, Chicago, Ill.

570,452 Bracket for pendant electric light globes; J. Christensen, Hartford, Ct.—A pendulous suspension member; a weight adjustably secured thereto and a holding member transversely adjustable its entire length, relatively to said weight and suspension member, and adapted to carry a lamp adjacent to one end thereof.

570,454 Galvanometer; C. Coleman, Chicago, Ill.—A pivoted armature and a magnet having pole-pieces provided with overlapping portions, whose opposing surfaces are parallel and concentric with the axis of motion of the armature.

570,481 Instrument for measuring electric currents; R. M. Hunter, Philadelphia, Pa.

570,496 Magnetic separator for threshing machines; E. H. Osborne, DesMoines, Iowa

570,508 Electric alarm bell; R. Segerdahl, Chicago, Ill.—A striker lever consisting of a lever of the first class having the weight and shaft and projections formed integral, and an armature which is formed separate and secured to the lever.

570,517 Incandescent lamp and socket; Alfred Swan, New York city, N. Y.—A base for lampsconsisting of a cup made of insulating material provided on its lower outer edge with a metallic ring and having a cylindrical cavity containing a metallic shell, the conductors of the lamp being respectively connected with the ring and the shell.

570,554 Electro-deposition; E. Jordis, Munich, Germany—In the art of electrolysis, the process which consists in preparing a bath containing a lactate of the metal to be deposited, and then precipitating the metal by means of an electrical current.

570,565 Electric railway; H. C. Reagan, Philadelphia, Pa.—A feed-wire and oscillatory contact mounted on the latter and provided with a magnetic arm or armature and a resilient non-magnetic arm also attached to said contact.

570,566 Magnetic path for underground electric railways; H. C. Reagan, Philadelphia, Pa.

570,616 Burglar alarm; F. Steinkoenig, Sioux City, Iowa.

570,663 Method of and apparatus for regulating dynamo generators or motors; J. W. Easton, Brooklyn, N. Y.

570,669 Lamp shade for electric lamps; C. A. Lapworth, Hopedale, Mass.

570,738 Electro-magnetic warp-stop motion for looms; A. C Shuttleworth, Philadelphia, Pa.

570,740 Trolley; F. T. Walton, Portland, Me.—A trolley with a suitable shank divided in two sections, the upper part thereof being provided with a tongue, the lower part with a groove, a socket in the bottom of said groove, a spring-actuated T-post seated in said socket and means for pivotally fastening said tongue in said groove.

570,755 Burglar alarm; F. Hessemer, Philadelphia, Pa.—An arm adapted to be secured to a door-knob, a plate pivoted to said arm, a double cam formed on the end of the arm, a spring-pressed detent slidably connected to the plate and having its heel-end bearing against the cam, and bell mechanism adapted to be locked by said detent

570,778 Telephone switch; C. N. Sandbeck, Harmony, Minn.—Comprising a casing, two spring contacts arranged therein, contact fingers adapted for arrangement with one of the spring contacts, plates movable to engage the other of said spring contacts and to move the contact fingers to close a circuit and electrical connection.

570,801 Street-lamp hanger; Hally P. Hill, Washington, D. C.—A traveling hanger, a pulley connected therewith, a lamp-rope provided with an enlargement, a bifurcated pawl, embracing said rope, and the inclined tracks adapted to direct the enlargement upon said lamp-rope away from the pawl.

570,823, 570,824 Electric arc-lamp; H. A. Seymour, Washington, D. C.

570,825 Carbon for arc lamps; D. A. Shesler, Toledo, Ohio—A composition for carbons for electric arc lights, consisting of graphitoid silicant, asbestos, carbon, and a binder.

570,827 Electrically controlled elevator; S. D. Strohm, Philadelphia, Pa.

570,840 Automatic telephone system; M. Brooks, Minneapolis, Minn.

570,852 Type printing telegraphic apparatus; F. H. W. Higgins, London, England—The type-wheel axis, the type wheels or rings, notched disks, a shield with a projection and a magnet and coil serving to move the shield.

WINTER FLORIDA SCHEDULE, SEASON 1896-97.

Commencing January 18, 1897, the Southern Railway will operate a Limited Pullman Vestibuled Train daily, except Sunday, between New York and St. Augustine, carrying coaches, dining cars, Pullman drawing-room sleeping cars, Pullman latest compartment cars and Pullman observation cars, leaving New York at 12.10 noon; Washington, 6.10 P. M.; arriving Jacksonville at 3.30 and St. Augustine at 4.30 the following afternoon. North bound, this palatial train will leave St. Augustine at 9.50 in the morning, Jacksonville at 11 o'clock, and arriving Washington 9.45 the following morning, and New York at 3.53 the same afternoon. This train is in addition to the two regular daily trains carrying Pullman sleeping and dining cars now operated, thus giving three trains six days in the week between New York, Washington, Jacksonville and St. Augustine, commencing January 18 next.

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REFERENCES: "Electrical Review," New York; Paul Cromlein, Teller Lincoln National Bank, Washington, D. C.; Judge Geo. D. Parker, Berkley, Va.; Second National Bank, Washington, D. C.; E. K. Leech, U. S. Mint, Philadelphia, Pa.; W. F. Newell, Manager and Secretary Water Works Olympia, Oregon.

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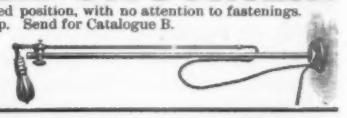

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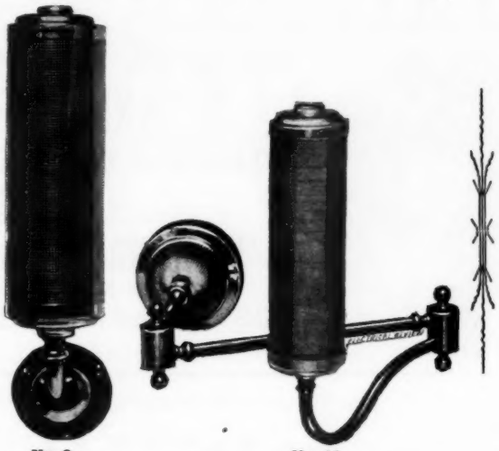

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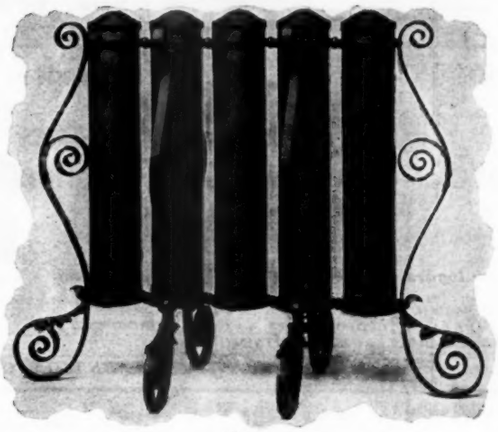

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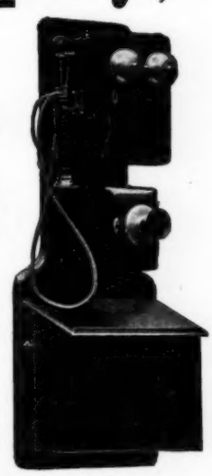

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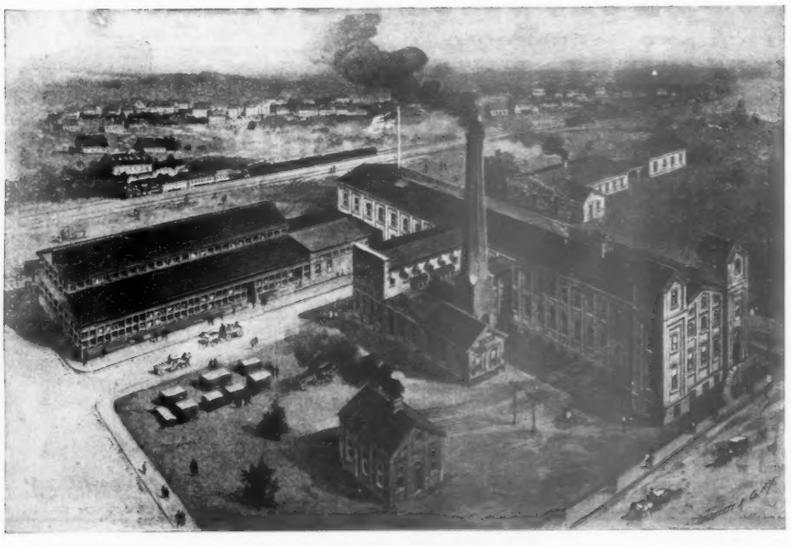

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